Amateur Radio

January 1997
Volume 65 No 1

Journal of the Wireless Institute of Australia

Full of the latest amateur radio news, information and technical articles including...

- **A Shielded Loop for 160 Metres**
- **Hybrid Antennas**
- **A Dip Meter Using Lambda Negative Resistance**

Plus *lots of other articles, amateur radio news and special interest columns*

DAYCOM

We wish all our customers a happy Christmas and may 1997 be all you wish for!

Get it first at Daycom!

IC-756 HF + 6m 100W, auto-ATU, DSP

If you missed our Icom Day at the end of November you missed the oportuity to see the all new IC-756. It was pretty hard to see anyway with the crowd always around it!

- All bands 160-6 metres
- 100W output on all bands
- Auto ATU works on all bands
- Dual watch receivers
- Spectrum Scope (just like the IC-781!)
- Dual Pass-Band Tuning
- Adjustable threshold DSP noise reduction
- Audio Peaking Filter
- Automatic Notch filter
- Built-in CW memory keyer
- 100 alphanumeric memories

Some of the reactions; "how much will you give me for my FT-1000 as a trade-in?", "Probably the most innovative radio since the IC781 hit the market!", "This is really a radio for all reasons, easy to use but with all the features a contester or DXer needs."

Limited quantities available mid-December, call to secure yours now:

$3999

IC-2710H Dual Band mobile

The very latest in dual band mobile convenience - removable front panel, remote control microphone & lots of options including PC cloning of radios! **$1250**

cushcraft CORPORATION

HF multiband beams

Model	A4S	A3S	A3WS
Frequency	28,21,14	28,21,14	24,18
Number of elements	4	3	3
Forward gain, dBd	8.9	8	8
Front to back ratio, dB	16	14	14
Power, watts PEP	2000	2000	2000
Boom length, metres	5.48	4.27	4.27
Longest element, mtrs	9.75	8.45	7.66
Turning radius, mtrs	5.49	4.72	4.4
Max mast size, mm	50	50	50
Wind load, square metres	.51	.47	.38
Weight, kg	16.8	12.3	10.24
Price (inc tax)	$1099	$916	$689

ICOM

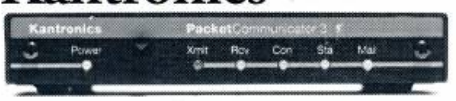
introductory special price: **$3400**

The ***NEW*** Icom R-8500 receiver is here now! It covers 100kHz to 2000MHz (no breaks) has 1000 memories and a host of features you wouldn't think possible at just $3750 Get the full story, call for a brochure or look on the WEB at http://www.daycom.com.au/

MFJ Performance you can afford!

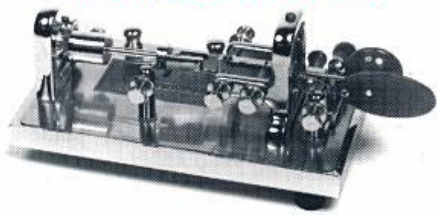
MFJ1270C 1200bps VHF/UHF packet	$249
MFJ1276 HF/VHF/UHF packet+PACTOR	$349
MFJ1278B 10 mode multi-mode controller	$599
MFJ1278B-DSP DSP added to MFJ1278B	$759
MFJ Packet options and accesories	
MFJ780 DSP add-in card for MFJ1278B	$219
MFJ781 External DSP for any TNC	$279

Kantronics



KPC-3 1200bps VHF/UHF packet	$249
KPC-9612 1200/9600bps dual port packet	$459
NEW KPC-9612+ coming - run out special	$395!
KAM+ Deluxe miulti-mode	$669

NEW Vibroplex prices



Original The standard mechanical keyer	
Grey wrinkle finish	$219
Chrome plated base	$249
Iambic for use with electronic keyers	
Grey wrinkle finish	$219
Chrome plated base	$249
Vibrokeyer a single lever paddle for keyers	
Grey wrinkle finish	$190
Chrome plated base	$239
Brass racer the latest in lambic keying	
Keyer only (wood base)	$139
With electronic keyer	$260

Vibroplex is only part of our great range of CW keys and keyers, call for details of other fine products we have in stock!

MFJ Antenna Tuners

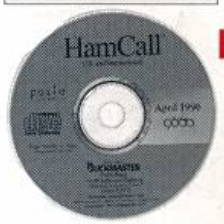
MFJ901B	200W Versatuner	$149
MFJ910	Mobile antenna matcher	$45
MFJ921	2 mtr 300W tuner	$155
MFJ924	70 cm 300W tuner	$155
MFJ931	Artificial ground tuner	$169
MFJ941E	300W compact GP tuner	$230
MFJ945E	300W mobile tuner	$209
MFJ948	Deluxe 300W (no D/L)	$270
MFJ949E	Deluxe 300W	$299
MFJ962C	1.5kW tapped inductor	$525
MFJ971	200W Portable tuner	$190
MFJ986	3kW Diff-T roller inductor	$629

MFJ989C 3kW Deluxe roller inductor $735

ARRL 1995 Publications CD-ROM

A whole years QST, QEX and NCJ magazines in a single CD-ROM - how convenient! With power ful reader technology the diagrams and photos appear inseparate windows. Fully searchable text. Requires 386 or better with Windows 3.1 or later.

$45



HAMCALL 1996

Our most popular callbook CD-ROM with WIndows, DOS and MAC search engines. Much new information this year including photos of many amateurs!

$45

TeKIT The NEW Heathkit!

Help reclaim this fascinating band! Six metres is the VHF DX band and even now offers regular overseas contacts with just a little effort. The TT1208 kit is the ideal, low cost way, to get going on 6 metres and find out what only the elite have known for years!

- Requires 3-5W input on 20 metres
- Extremely simple hookup and operation
- Sensitive, low noise 50-54MHz front end
- Fast, silent PIN diode TR switch for QSK & data
- 8W output on 6 metres
- Requires 12-15V DC 3A power supply
- Simple switching between HF and 6 metres
- Rugged steel case

TT1208 8W 6 metre transverter **$199**

DAYCOM Communications Pty. Ltd.
44 Stafford Street, Huntingdale 3166
Bankcard, MasterCard & Visa all welcome
Phone (03)9543-6444
FAX (03)9543-7238

Amateur Radio

Journal of the Wireless Institute of Australia

Vol 65 No 1 ISSN 0002-6859 January 1996

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

Editorial

Editor
Bill Rice VK3ABP*

Production Manager
Bill Roper VK3BR

Senior Technical Editor
Peter Gibson VK3AZL*

Technical Editors
Evan Jarman VK3ANI*
Gil Sones VK3AUI*

Contributing Editors
Ron Fisher VK3OM*
Roger Harrison VK2ZRH

Proof Readers
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC
**Publications Committee member*

Production
Administration, Advertising, Drafting, Production
vk3br Communications Pty Ltd
3 Tamar Court, Mentone VIC 3194

Typesetting and Printing
Industrial Printing and Publishing Pty Ltd
122 Dover Street, Richmond, VIC 3121.

Mail Distribution
Mail Management Australia Pty Ltd
6 Garden Boulevard, Dingley VIC 3172

New Advertising
Eyvonne & Keith Tootell
Union Publicity Service Pty Ltd
PO Box 282, Toongabbie NSW 2146
Telephone: 1800 654 181 – 02 9831 1299
Fax: 02 9831 6161

***Amateur Radio* Correspondence**
All contributions, correspondence, Hamads and queries concerning the **content** of Amateur Radio should be sent to:
Amateur Radio
vk3br Communications Pty Ltd
3 Tamar Court, Mentone VIC 3194
E-mail: vk3br@c031.aone.net.au
Phone and Fax: (03) 9584 8928
Mobile: 0418 534 168
Business Hours: 9.30 am to 3.00 pm weekdays

***Amateur Radio* Delivery**
All correspondence and queries concerning the **delivery** of *Amateur Radio* should be sent to:
Amateur Radio
WIA Federal Office
PO Box 2175
Caulfield Junction VIC 3161

Registered Office:
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 9528 5962
Fax: (03) 9523 8191
Business Hours: 9.30 am to 3.00 pm weekdays

Editorial and Hamads Deadlines

February	13/01/97
March	10/02/97
April	10/03/97

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA.

CONTENTS

Cover

One of the highest repeaters in Australia, the VK2RMS 2 m repeater is situated on "Bald Hill" at 1765 m overlooking Lake Eucumbene in the Snowy Mountains. The antennas are mounted on a Nally tower, the equipment is housed in a metal cabinet with 30 W output, and it is solar powered with 350 amp hours of battery capacity. The snow does not seem to affect the solar power. Sponsors of the repeater are Glen VK2JPR, David VK2XKE, and Rod VK2TWR, who submitted the photograph.

The photo by Bruce Davey was taken from a helicopter.

BACK ISSUES
Available, only until stocks are exhausted, at $4.00 each (including postage within Australia) to members.

PHOTOSTAT COPIES
When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society
Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union
Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 2175, Caulfield Junction, VIC 3161
Telephone: (03)9528 5962 Fax:(03) 9523 8191

Business Hours: 9.30 am to 3.00 pm on weekdays

Federal Secretary
Peter Naish VK2BPN

COUNCIL

President	Neil Penfold	VK6NE
VK1 Federal Councillor	Richard Jenkins	VK1RJ
VK2 Federal Councillor	Michael Corbin	VK2YC
VK3 Federal Councillor	Brenda Edmonds	VK3KT
VK4 Federal Councillor	Ross Marren	VK4AMJ
VK5 Federal Councillor	Grant Willis	VK5ZWI
VK6 Federal Councillor	Bruce Hedland-Thomas	VK6OO
VK7 Federal Councillor	Jim Forsyth	VK7FJ

EXECUTIVE

Peter Naish	VK2BPN
Lance Bickford	VK4ZAZ
Rowland Bruce	VK5OU
Neil Penfold	VK6NE

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contests:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC and Standards	Roger Harrison	VK2ZRH
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
IARU:	David Wardlaw	VK3ADW
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
ITU Conference and Study Group:	David Wardlaw	VK3ADW
Media:	Roger Harrison	VK2ZRH
QSL Manager (VK9,VK0):	Neil Penfold	VK6NE
Radio Sports:	Wally Watkins	VK4DO
Videotapes:	Bob Godfrey	VK4BOB
WICEN:	Leigh Baker	VK3TP

SMA LIAISON TEAM

Roger Harrison	VK2ZRH
David Wardlaw	VK3ADW
Neil Penfold	VK6NE

Editor's Comment

Changes in the System

In last month's issue it was reported in *WIA News* (December, page 8) that the Federal Executive had been directed by Council in May to investigate "outsourcing" the production of *Amateur Radio* magazine. This was also briefly mentioned in the *Editor's Comment* for the October 1996 issue, and was implemented by an advertisement in September calling for tenders.

Five tenders were received and, after careful comparison, the one selected was from a company formed for the purpose by our erstwhile Production Editor, Bill Roper VK3BR. Bill's tender was not only for production, printing and mailing, but also for administration, which involves negotiation with contributors and advertisers, hitherto a function of the Federal Office. Time will tell how significant is the cost reduction which may be achieved, but there is no question that Bill is uniquely qualified to achieve savings if savings are possible.

An obvious consequence of the administrative changes is that our address for submission of written material has also changed, and becomes: Amateur Radio, vk3br Communications Pty Ltd, 3 Tamar Court, Mentone 3194. Much material is already received by e-mail, for which the address is unaltered. All these changes are set out in our new masthead on page 1. We hope all can be implemented with minimal administrative "hiccups".

Bill Rice VK3ABP
Editor

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

1997 Membership Campaign Provides Attractive Incentives for Recruits and Renewals

A nationwide membership recruitment and retention campaign for 1997 kicks off this month, offering separate incentive prizes for new recruits and renewing members. The campaign runs throughout 1997, from 1 January through 31 December.

Each month, from January through December, new members joining in a given month will go into a draw to win a magnificent Fluke Model 12B hand-held digital multimeter, worth $195. Twelve multimeters are to be won by twelve lucky new members joining in 1997. New recruits may subscribe to any grade of membership to be eligible. The winner for each month will be drawn, and the prize presented, in the following month. That is, the winner from January's new members will be drawn in February, and a Fluke 12B multimeter presented to the winner that month, and so on.

Members whose annual renewals fall due between 1 January and 31 December, and who renew on time, go into a draw to win a fabulous Kenwood TM-733A dual-band 2 m/70 cm FM mobile transceiver, worth $1255. All grades of membership are eligible, and life members and those on three-year subscriptions are included automatically. The winner will be drawn and the prize presented in January 1998, or the nearest available opportunity after that.

New recruits in 1997 are not eligible to enter the draw for the Kenwood transceiver. They'll have to wait for the next membership retention campaign.

WIA Federal President, Neil Penfold VK6NE, said: *"I urge all the Divisions and affiliated clubs to get behind the 1997 Membership Drive, to publicise it at every available opportunity – at meetings, field days and conventions, on broadcasts and nets, in club newsletters and any mail-outs. I encourage all members to recruit new members for their Division, the chances of recruits winning a Fluke digital multimeter are quite good!*

"With important World Radio Conferences being held this year and in 1999, and considerable changes happening in radiocommunication in Australia, which have the potential to affect amateur radio, membership of the WIA at this time is vitally important to help preserve those privileges fought for and won in the past, and to improve our conditions and privileges in the future," he said.

"It was the WIA which lobbied for and negotiated improved privileges and operating conditions for Australian amateurs, introduced in 1995. It was the WIA which successfully lobbied the government to reduce a proposed massive increase in licence fees in 1995.

"This campaign's prizes aside, there are many advantages to becoming, and remaining, a member of your WIA Division. For example, the Institute's monthly journal, Amateur Radio, is the only monthly magazine devoted entirely to amateur radio. Receiving Amateur Radio magazine is an exclusive benefit of membership. Divisions offer low-cost QSL bureau services, discounted publications and other services to help members enjoy their hobby more," he said.

The twelve Fluke Model 12B digital

multimeters, worth $2340 in total, have been generously donated by Philips Electronics Australia's Test and Measurement division. The Fluke 12B measures AC and DC voltage (with auto-selection above 4.5 V), resistance and capacitance (.001-1000 µF). The instrument features a simple rotary dial, a 4000-count liquid crystal display, and diode and continuity testing. Its "continuity capture" feature indicates intermittent open and short circuits. It comes with test leads and a two-year warranty. Fluke is the world's pre-eminent manufacturer of digital test instruments and the Model 12B is from their recently-released range of hand-held instruments.

Every newcomer to electronics and amateur radio needs a good multimeter, and every seasoned enthusiast could always do with another one!

The TM-733A dual-band FM transceiver, kindly donated by Kenwood Electronics Australia, offers both FM voice operation as well as 1200 and 9600 baud connection for a digital modem or terminal node controller (TNC) for packet radio operation. The rig provides 50 watts output on the 2 m band and 35 watts output on the 70 cm band. Ten watt and 5 W settings are also available. The TM-733A features simultaneous dual-band VHF-UHF reception, as well as dual-channel reception on VHF or UHF. The front panel features a large, high visibility liquid crystal display showing VHF and UHF operating frequencies and key operational functions. The frequency synthesiser features selectable frequency steps of 5, 10, 12.5, 15, 20 or 25 kHz. There is auto repeater offset for 2 m, and switches to set repeater-reverse and repeater offset. To optimise reception under different conditions, you can select high sensitivity to cope with weak signals, or "high intercept point" to cope with strong-signal, adjacent channel interference.

The TM-733A has 70, 6-in-1 multi-function memory channels. A multi-scan reception function provides for scanning a full band, memory channel scanning, "MHz scan", etc. The TM-733A operates from 13.8 Vdc and is ideal for mobile, portable or home use by amateurs holding any grade of licence. For any not-yet-licensed Associate member who may win the transceiver, the WIA trusts that they will make responsible use of the equipment.

International HF Beacon Project Progresses

The HF beacon, which will become the Australian link in the five-band International Beacon Network chain, was licensed in early December, being issued the call sign VK6RBP. The equipment is expected to arrive in Australia from California early this year, and will be installed at the Roleystone repeater site of VK6RHF/VK6RAP.

Meanwhile, this month the Heard Island DXpedition is expected to activate a temporary five-band HF beacon, VK0IR, during their stay on the sub-antarctic island.

The HF beacons transmit on five bands in sequence, ten seconds on each band, over a 50-second period. The frequencies are 14.100, 18.110, 21.150, 24.930 and 28.200 MHz. The 18 planned beacon stations in the International Beacon Project (IBP) network each have an allocated 50-second time slot in the three minutes necessary for all to transmit. The transmission sequence repeats every three minutes. The first beacon in the sequence list (time slot 1) is 4U1UN, atop the United Nations tower in New York.

The Heard Island beacon, VK0IR, has time slot 8, immediately following JA2IGY, located near Tokyo, Japan. JA2IGY is presently only licensed to transmit on 14.100 MHz, and commences transmission one minute after 4U1UN. JA2IGY is readily copied in Australia.

The New Zealand five-band HF beacon, ZL6B, arrived in the country late last year and was anticipated to be on-air by now. It has time slot 5, commencing 40 seconds after 4U1UN.

A transmission consists of the call sign of the beacon sent at 22 words per minute, followed by four one-second dashes. The call sign and first dash are sent at a power of 100 watts. The remaining dashes are sent at 10 watts, 1 watt and 0.1 watts. The 10 dB power steps are precise, and are useful for judging band propagation conditions (how much or how little power can be used for a given signal-to-noise ratio), or for S-meter calibration.

As of early December last year, a total of 12 five-band HF beacons were operational: 4U1UN UN (New York), VE8AT Canada, W6WX California, KH6WO Hawaii, JA2IGY Japan, ZS6DN South Africa, 5Z4B Kenya, 4X6TU Israel, OH2B Finland, CS3B Madeira, LU4AA Argentina, and YV5B Venezuala. New Zealand (ZL6B) has received their equipment, as has Sri Lanka (4S7B). Equipment for Peru (OA4B) was ready to ship late last year. A site for a station in the People's Republic of China (BY) is being located. The Heard Island beacon (VK0IR) is using the time slot which will eventually be used by a Russian beacon.

Equipment used at each beacon site consists of a Kenwood TS-50S transmitter, a Cushcraft R-5 vertical antenna, a Trimble Navigation Accutime GPS receiver (satellite global positioning system, for accurate timing), and a controller built by the project coordinators, the Northern California DX Foundation (NCDXF). The International Beacon Project is a cooperative venture between the NCDXF and the International Amateur Radio Union. Further information and regular updates are obtained from the NCDXF's Internet site at *www.ncdxf.org/beacon.htm* or the NZART's Internet site at *www.nzart.org/nzart/ar_ww/iaru/beacon.html*

Well-known Amateur, Neville Williams VK2XV, SK

Electronics publishing industry identity, Neville Williams VK2XV, passed away early in November. He was known to many amateurs, and many in the electronics and broadcasting industry, for his long association with *Electronics Australia*.

Born in 1911, his interest in technology was awakened as a young boy from being around the picture theatre set up by his grandfather and father in the country town where the family lived. Neville completed his education in Sydney and joined a wireless receiver manufacturer, later moving to the Amalgamated Wireless Valve Co (AWV), where he worked on the production of data sheets and the publication which became the radio industry's "foundation text", *The Radiotron Designers Handbook*," edited by Fritz Langford-Smith.

For two years before joining *Radio and Hobbies in Australia* in 1939, Electronics Australia's forerunner, Neville contributed regular articles. Soon after Neville joined the magazine, the then Editor, John Moyle, left for war service leaving Neville in the Editor's chair for the duration.

When television came to Australia in 1956, Neville was ready with a build-your-own TV set project, which was published in the magazine. He returned to the Editor's chair following the death of John Moyle in 1960 (whom the WIA annual National Field Day commemorates). The magazine became *Radio, TV and Hobbies in Australia*, in keeping with developments, and then Electronics Australia in the 1960s, recognising the impact of the then-burgeoning solid-state technology.

During the early 1970s, Neville instigated a number of new publications. *Modern World*, which had only a short life owing to insufficient advertising support, then two trade journals: *Electronics News* followed by *Broadcast Engineering News*, both of which are still vigorous, industry-leading publications more than 20 years on.

Neville retired in 1983, but continued making regular contributions to *Electronics Australia, Silicon Chip* and other publications, contributing a last story to EA shortly before his death. Neville is survived by his wife and their children. Among those at his well-attended funeral was audio and broadcast industry identity, Neville Thiele, retired electronics industry identity, Geoff Woods, long-time EA amateur radio columnist, Pierce Healy VK2APQ, current EA Editor, Jim Rowe VK2ZLO, and retired ex-EA staffers, Phil Watson VK2ZPW and Ian Pogson VK2AZN. Attending for the WIA, was Roger Harrison VK2ZRH.

Spectrum on the Auction Block

In November, the Spectrum Management Agency (SMA) advertised in the national press inviting applications from people and organisations interested in participating in the first issue of spectrum licences in Australia, which will involve the auction of licences for two, 4 MHz wide bands at 500 MHz. Registration for this first spectrum licence auction closed in December and the auction process is anticipated to take place early this year.

The two bands involved are 501-505 MHz and 511-515 MHz. They have been divided into a range of bandwidths, from 12.5 kHz to 1 MHz, both bands being available for licensing in 17 geographical areas across Australia. Prospective licensees will be able to bid for spectrum usage by band, bandwidth and geographical area. Some 900 separate licence "lots" will be available for purchase at auction.

Successful bidders will be able to determine the use of the spectrum within the band and geographical region set by the core conditions of the spectrum licence. Licensees will be able to trade the licences, as well as sub-let channels or bands in any or all geographical areas set by the licence.

Bidding will be conducted Australia wide on a computer-system hookup. Interested bidders who don't have a computer are able to make telephone bids. The multiple-round simultaneous auction system was devised by the US's Federal Communications Commission (FCC). Money paid by successful bidders goes to government revenue. Spectrum licences have a term of 10 years, without automatic renewal, when they may be auctioned again.

This first spectrum licence auction is being viewed as a "practice run" for further auctions of spectrum likely to be highly valued by telecommunications carriers following deregulation of the industry from 1 July 1997, when coming changes to the Telecommunications and Radiocommunications acts take effect.

Also last year, the SMA sought public comments on proposals to release spectrum near 1.8 GHz to provide for new telecommunications services from 1 July 1997.

The introduction of spectrum licensing, initiated by the 1992 Radiocommunications Act, has not been without some controversy while being cautiously welcomed by industry. The 10-year licence term is widely considered as too short, pressuring licensees to use the least-cost technology in order to maximise their financial return within the 10-year term. The lack of certainty of renewal occasions similar pressures. Both these things do not encourage efficient use of spectrum, according to industry criticism. In addition, there were questions over the technical framework, settlement of interference disputes and compulsory registration of equipment.

Meeting Date Set to Present Licensing Submission to Minister

The WIA will meet with the Minister for Communications and the Arts, Senator Robert Alston, on 12 February to present the completed submission on Amateur Radio Service licensing.

WIA Federal President, Neil Penfold VK6NE, faxed a letter to Senator Alston on Monday, 2 December last, the day Parliament resumed after the November recess. In his letter to the Minister, the President said: *"I am writing to seek a meeting to present the completed submission to you at the earliest available opportunity, particularly in view of the foreshadowed changes to the Radiocommunications Act."*

The Minister's office replied two days later on Wednesday, 4 December, setting the meeting date for 12 February. It will be held at the Minister's electoral office in Melbourne. This will be in the week following the Federal WIA Extraordinary Convention, being held over the weekend of 8-9 February.

Copies of the finalised submission have been sent to each Division for consideration before it is presented to the Minister.

New Devices Class Licensed for 13 cm and 6 cm Bands

Radio transmission systems used in "wireless" data and computer network systems, operating in the 2400-2483 and 5725-5875 MHz ranges, have been provided a Class Licence by the Spectrum Management Agency. These are in the 13 cm and 6 cm amateur band allocations, but amateurs have access to these bands only on a secondary basis.

The SMA said the new Class Licences were introduced to support growing demand for short-range devices used in radio local area networks, wireless PABXs, barcode reader and point-of-sale network applications. The new Class Licences cover equipment using spread spectrum transmission, with transmitter powers of 200 mW in the segment 2463-2483.5 MHz, 4 W in 2400-2463 MHz, and 1 W in the 5725-5875 MHz band.

The 2400-2450 MHz band is designated an Industrial, Scientific and Medical (ISM) services band, while the primary service on the 5725-5850 MHz band is radiolocation, with amateurs as secondary; 5850-5925 MHz is for fixed and fixed-satellite services. It seems 5725-5850 MHz is a recent ISM allocation.

While the SMA said, *"The licence was developed in close consultation with industry representatives seeking to introduce these products in Australia and incumbent spectrum users, in order to establish a basic interference management regime within the licence that would satisfactorily manage the potential for interference between all spectrum users in these bands,"* the WIA did not hear of them until the new Class Licences were announced.

Meanwhile, a European ISM band allocation at 433 MHz has brought UK car owners and dealers considerable consternation because continental cars sold in Britain had wireless key fobs which had people locked out of their cars when strong UHF transmissions blocked the radio key fob signal.

These radio activated key entry (RAKE) devices were allocated 433.92 MHz in Europe. In the UK, this is in the amateur 70 cm band, while closely adjacent bands are used by mobile radio networks and the Ministry of Defence. It was reported in the middle of last year that people were finding themselves locked out of their new cars all round the country.

A committee has been set up to deal with the problem, called the RAKE committee. Members include the Radio Society of Great Britain, the Royal Auto Club, the Society of Motor Manufacturers and Traders, and the Electronic Vehicle Security Association. *WIA News* expects to publish developments on the RAKE's progress later in the year.

ar

■ Antennas

A Shielded Loop for 160 Metres

Ian Berwick VK3ALZ describes a compact receiving antenna for 160 metres.*

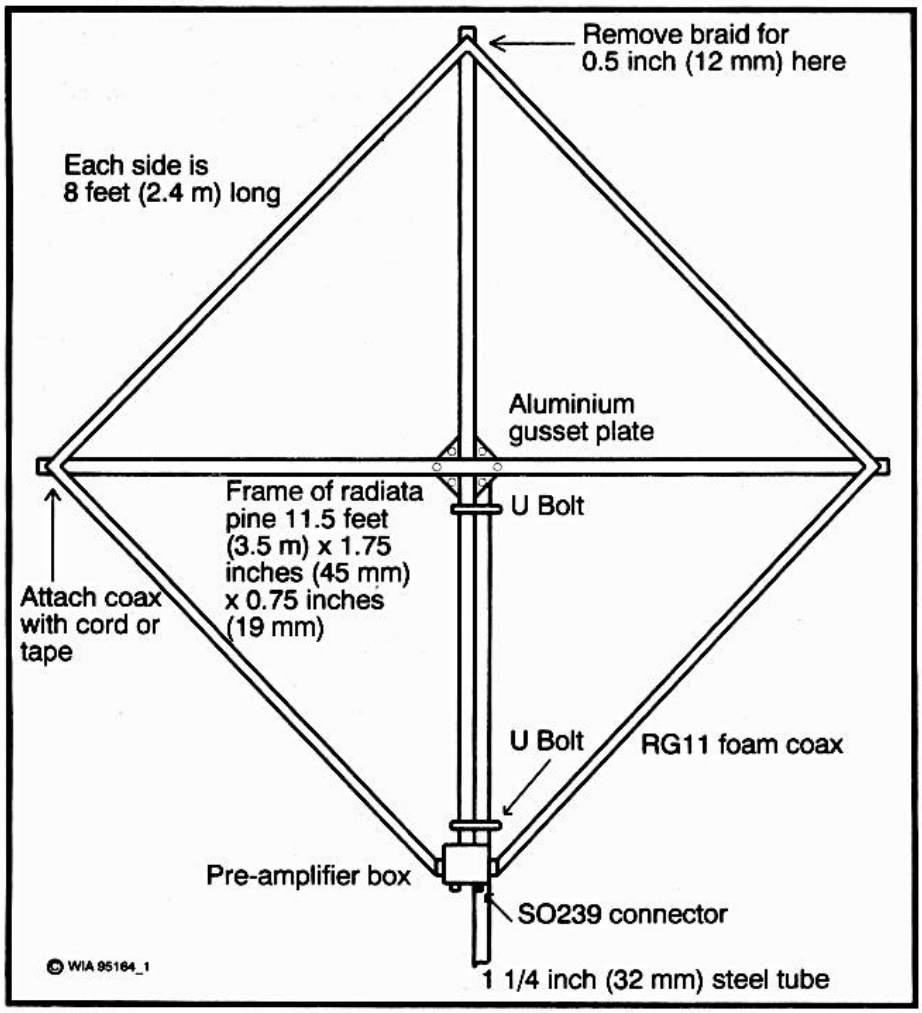


Figure 1 – Shielded loop construction. Pine timbers should be thoroughly painted with UV resistant paint to prevent deterioration. This timber is available at most hardware stores.

The shielded loop is not new. It is described in the *ARRL Antenna Handbook*. However, I have made a study of it in order to maximise its performance.

There are two factors which are the key to loop performance. These factors are:

1. The area enclosed by the loop. The enclosed magnetic flux (and hence the received signal), increases with this area.
2. The preamplifier. The loop is a resonant circuit and any induced voltage is magnified by the loop Q. We do not want the preamplifier input impedance to load the resonant circuit and hence reduce the Q. The signal level will be low in any case and so the preamplifier has to provide gain.

The loop, of necessity, will be some distance from the receiver. Therefore, the preamplifier output will typically have to drive up to 100 feet of coaxial cable. An emitter follower is required. Also, a high pass filter is required at the input to eliminate cross modulation due to high powered AM broadcasters.

Reverting to 1. above, the loop perimeter cannot be increased indefinitely. At a certain length, depending on the cable, the loop becomes self resonant at 160 metres. For the commonly available foam dielectric cables, this length is about 30 feet (9.144 metres).

The above requirements are incorporated into my design.

Briefly, the preamplifier consists of a dual gate FET tuned amplifier followed by a boot-strapped emitter follower. There is an elementary high pass filter at the input. The loop sees an impedance of approximately 20 kilohms, whilst the boot-strap reduces the loading on the FET tuned circuit.

The loop should be mounted 20 feet or more above ground level and be clear of metal structures. It should also be rotatable through 180 degrees. It is a great advantage to mount a compass on the rotator shaft as the loop can be more easily used as a direction finder for intruders. For further information, refer to my article on the **Adcock Finder** for the 10 metre band (*Amateur Radio*, March 1993, p17).

Loop Design Equations

A:

$$C = \frac{7.36 * E * S}{Log_{10}(D/d)}$$

where
C = pF
E = dielectric constant
D = inner diameter of outer in inches
d = outer diameter of inner in inches
S = perimeter length in feet

B:

$$L = 1.9 * S((7.353 * Log_{10}\frac{96S}{\pi * d}) - 6.386) * 10^{-8}$$

where
L = microhenries
This equation is for a circular loop. For a square loop, reduce L by 27 percent.

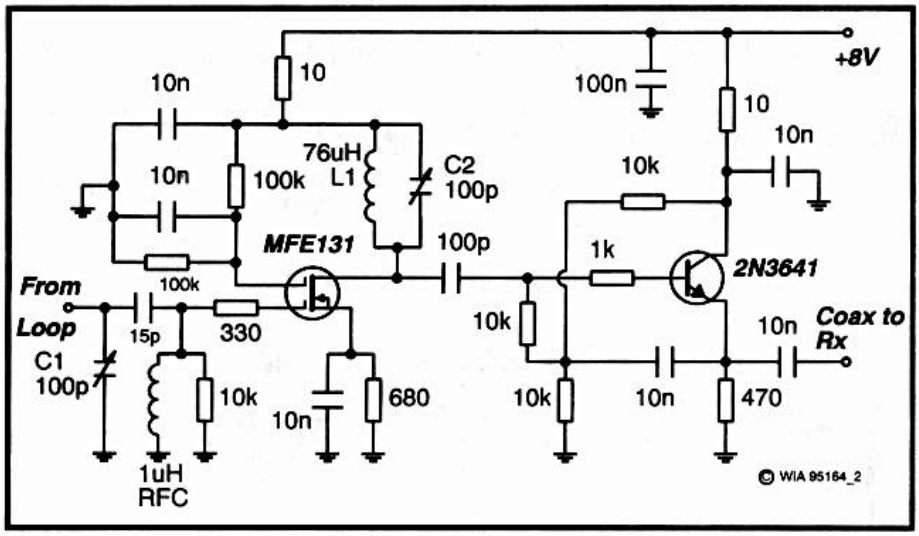


Figure 2

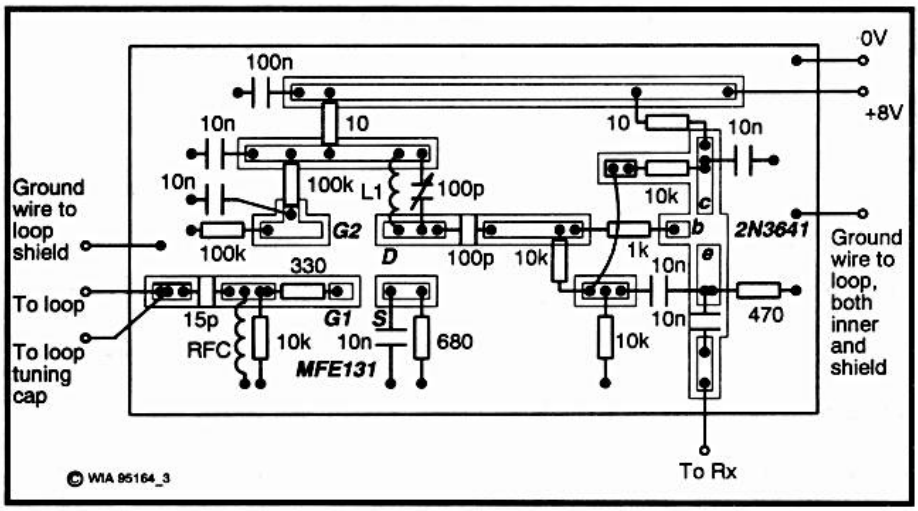


Figure 3

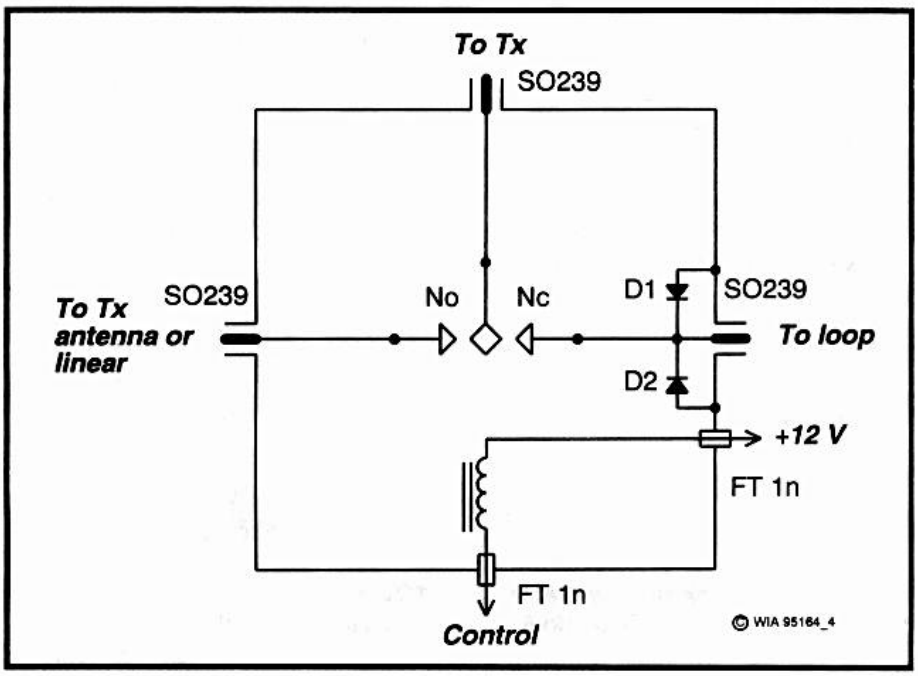


Figure 4

DIAGRAM CAPTIONS

Figure 2 – 160 m shielded loop preamplifier. 1 mH ex Dick Smith. L1 – wind on Amidon T68-2 core. C1 has to be an air variable, tunable from outside the box. For long runs of feeder coax, replace the 2N3641 with a larger transistor (100 mA Ic or more) and reduce R1 to 270 ohms. Resonate L1 C2 at 1840 kHz. Resonate loop at 1820 kHz with C1. This yields a passband flat within 4 dB over the 160 m band.

Figure 3 – PC board for the loop preamplifier. The 2N3641 mounts on the rear of the board – all other components can be on top. The PC board mounts in a 7" x 4.75" x 3" diecast box, along with C1 and three SO239 connectors.

Figure 4 – Switch box circuit. Back to back diodes (D1, D2 – EM401 or equivalent) protect the preamplifier in the event of a relay failure. The box is ex Dick Smith (catalogue No H2305), and the antenna change-over relay is also ex Dick Smith (catalogue No P8010).

C:

$$F = \frac{10^9}{2 * \pi * \sqrt{LC}}$$

where
L = microhenries
C = pF
F = Hz
F has to be greater than the maximum working frequency by about 10 kHz.

Method for Using Design Equations

1. Select a cable, say RG11 foam.
2. Make an estimate of S.
3. Compute C and L using equations A and B.
4. Substitute C and L in equation C to find F.
5. If F is too low, reduce S. If F is too high, increase S. Then try again.
6. Continue adjustments until F is correct.
7. If dissatisfied with S, try another cable.

*107 Loongana Avenue, Glenroy VIC 3046

ar

Have you advised the SMA of your new address?

QSP News

Change to Apparatus Licences

The Spectrum Management Agency is planning to change the way in which licence conditions are imposed on Aircraft, Aeronautical and Amateur licences. It is proposed that Technical Licence Specifications will be replaced by Radiocommunications Licence Conditions Determinations. The new approach will require the revocation of the existing Technical Licence Specifications attached to these licences. The Spectrum Management Agency invites public comment on the revocation of the Technical Licence Specifications in accordance with section 180 of the Radiocommunications Act 1992.

Amateur licence conditions are specified in a number of Technical Licence Specifications and in the *Radiocommunications (Licence Conditions) Determination No 1 of 1995* (formally conditions in the *Radiocommunications Regulations*). It is intended that they be included in a single Radiocommunications Licence Conditions Determination which will consolidate all conditions into one document. The licence conditions will remain essentially unchanged apart from some minor changes to clarify an existing condition or to correct typographical errors.

The new Amateur Radiocommunication Licence Conditions Determination will consist of one part that has common conditions and additional separate parts for each category of amateur station. Amateur licensees will be notified of the parts relating to their licence at the time the licence is renewed or updated. Licensees with multi-year licences will be advised in advance of the renewal of their licence.

The Spectrum Management Agency expects the Amateur Radiocommunications Licence Conditions Determination to be in place by early 1997. Copies of the Amateur determination will be available from any Spectrum Management Agency office shortly after it is gazetted.

Please send written comments to: Ray Wyeth, Business Directions Group, Spectrum Management Agency, PO Box 78, Belconnen ACT 2616. The closing date for comments is 31 January 1997.

■ Antennas

Hybrid Antennas

Have you ever wondered where your favourite antenna radiates? Ralph Holland VK1BRH provides some food for thought.*

Introduction

Hybrid antennas are composed of elements that emit a mixture of horizontal and vertical polarisation. Radiation from these antennas has different mixtures of horizontal and vertical polarisation at different azimuth and/or elevation angles. Hybrid antennas have been reported to have a tendency towards omni-directional radiation patterns. This article presents computer simulations of some simple hybrid antennas.

Simulation Parameters and Graphs

The simulations were performed by NEC-2 (Ref 1) for antennas composed of 1.22 mm loss-less wire elements at 14 MHz above average ground and sea water. Two ground parameters were specified for the simulations: relative dielectric constant and conductivity in millisiemens per metre; these are represented (in that order) in enclosed square-brackets. Eg [13,5] represents average clay soil, while [80,5000] represents sea water (Ref 2).

The graphical results show radiation efficiency and feedpoint impedances for various displacements; displacement is the term used for the distance between the lowest point of the driven element and the ground.

In addition, three-dimensional antenna radiation patterns have been plotted for the total gain, which involves the summation of the response to both horizontally and vertically polarised signals. This gives a realistic indication of the HF antenna performance, as ionospheric propagation causes mixed polarisation. The graphs show the gain between 90 and 10 degrees elevation (inclusive), in steps of 10 degrees, across the full range of 0 to 360 degrees of azimuth, in five degree increments.

Half-wave Sloping Dipole (Sloper)

The basic half-wave sloper is a half-wave dipole inclined 45 degrees to the ground and is probably the simplest of all the hybrid antennas. When the sloper is fed in the centre its feedpoint resistance is greater than 75 ohms. This antenna has been reported as having a near-omni-directional radiation pattern based on measurements by several authors (Ref 3).

Fig 1 shows the efficiency of a sloping dipole as the displacement is varied. Fig 2 shows the feedpoint impedance of the sloper versus the displacement for average ground [13,5]. Notice that it is quite inductive and hence can be shortened, with consequent reduction in feedpoint resistance.

Fig 3 illustrates the radiation pattern for the sloper displaced 0.09 wavelengths above average ground [13,5]. Fig 4 illustrates the radiation pattern for the sloper displaced 0.09 wavelengths above sea water.

The VK3AM Marine Hybrid

This antenna is a bent half-wave dipole (Ref 4). The driven element is shaped like an L, with each side being one quarter of a wavelength. The antenna is oriented so the end of the bottom of the L points to 0 degrees azimuth (ie lies on the X axis), the remainder is vertical.

Fig 5 illustrates the radiation efficiency over average ground [13,5] and sea water [80,5000] at 14 MHz. Fig 6 demonstrates the variation of the feedpoint impedance with displacement for average ground [13,5]. The initial peak in the feedpoint resistance is almost eliminated when simulating over sea water and the resistance and reactance were substantially the same as the poorer ground.

Fig 7 illustrates the radiation pattern, for the hybrid at 0.09 wavelengths displacement for average ground [13,5]. Note that there is a severe hole in the pattern centred around 180 degrees azimuth. The hole is on the left-hand-side looking directly at the L. This hole, although it is reasonably severe, probably is not as bad as it looks,

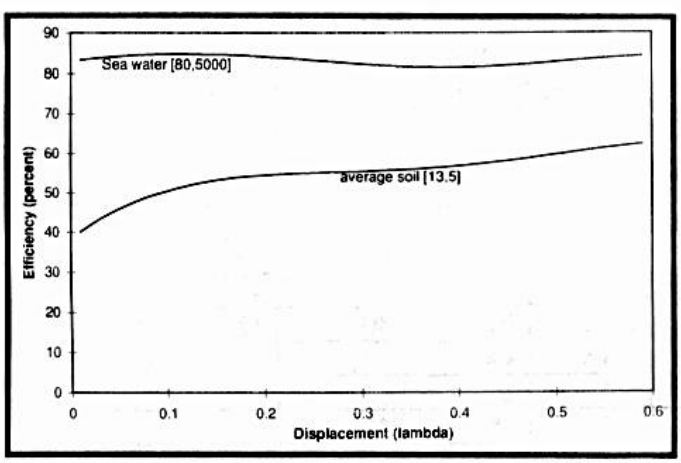


Figure 1 – Efficiency of sloping dipole.

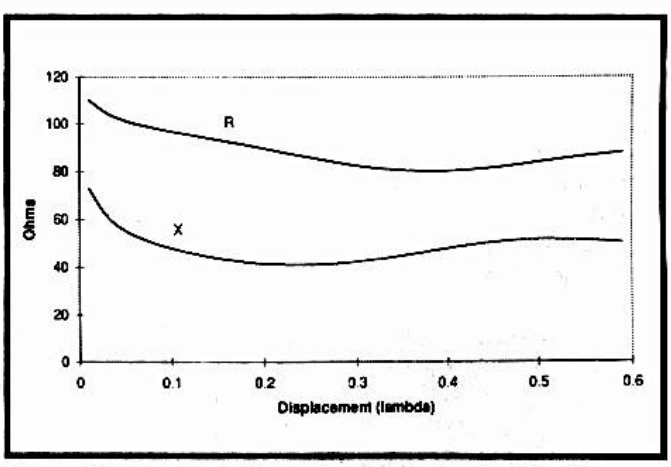


Figure 2 – Feedpoint impedance of sloping dipole

because at 10 degrees elevation the pattern recovers with -5 dBi gain.

Fig 8 illustrates the radiation pattern when the hybrid is displaced 0.09 wavelengths above sea water, a near-perfect ground [80,5000]. The low elevation pattern is remarkably ideal. Consequently, the elevation axis has been inverted (compared with Fig 7) to prevent obscuration of the lower gain at higher elevations. Notice that there are now two holes in the radiation pattern (0 and 180 degrees); but the holes appear at high elevations and are not severe.

This antenna would certainly be a good marine antenna since it has good low angle radiation, it is omni-directional, and is reasonably efficient above sea water.

V Antenna

The traditional V antenna is mounted horizontally and each side is several wavelengths long. A less traditional V antenna has been modelled where each leg is only one quarter of a wavelength long and this antenna is mounted vertically.

Fig 9 illustrates the efficiency of the V antenna mounted above average ground [13,5] and above sea water [80,5000]. Notice that this antenna has slightly better efficiency than the Marine Hybrid (L).

Fig 10 shows the variation of feedpoint impedance with displacement above average ground. Fig 11 shows the radiation pattern for the antenna displaced 0.09 wavelengths above average ground, while Fig 12 shows the radiation pattern when mounted 0.09 wavelengths above sea water.

In Fig 11 notice that above average ground the gain varies between 5 dBi to -6 dBi from elevation angles of 90 down to 10 degrees (less than 2 S-points variation). In Fig 12 notice that the gain is higher at most elevations, except two holes appear in the same fashion as the pattern for the VK3AM Marine Hybrid. Again the holes are severe, but the pattern recovers at the elevation of 10 degrees where it is 10 dB down (1.7 S-points).

This antenna is relatively poor for DX compared to the VK3AM Marine Hybrid operating over sea water as the holes in the V antenna's radiation pattern appear at relatively low elevations and the gain at low elevations has been reduced

Half-wave Inverted L

This simulated inverted L is not the traditional-type antenna that is used on low-bands but rather a half-wave inverted L which is fed at the apex. The feedpoint impedance will be close to 50 ohms.

Fig 13 illustrates the efficiency of this configuration versus mounting displacement above average soil and sea water. Fig 14 illustrates the feedpoint impedance for the antenna above average soil. Note that this antenna, too, has a feedpoint impedance largely independent of mounting height and consequently soil parameters.

Fig 15 displays the radiation pattern for the antenna mounted 0.09 wavelengths above average soil. Fig 16 displays the radiation pattern when the antenna is mounted 0.09 wavelengths above sea water. This antenna has less than 3 dB variation over its entire radiation pattern.

Inverted V

This inverted V antenna is a half-wavelength long and mounted at varying displacements above ground and fed at the apex. The feedpoint resistance should be around 50 ohms.

Fig 17 illustrates the efficiency of the antenna mounted at various displacements. Fig 18 demonstrates how the feedpoint impedance is relatively independent of the height above ground.

Fig 19 shows the radiation pattern when mounted 0.09 wavelength above normal ground [13,5]. Fig 20 shows the radiation pattern when mounted 0.09 wavelengths above sea water [90,5000].

Summary

A summary of the total gain patterns has been provided in Table 1.

Conclusions

All these hybrid antennas have feedpoint impedances which are relatively independent of the ground parameters and mounting height.

The radiation patterns from some hybrids are almost omni-directional; most hybrids have near circular radiation patterns at higher elevations. The VK3AM Marine Hybrid and the Inverted L have good performance at low elevations over sea water.

Most of the hybrid antennas, however, have holes or dips in their radiation patterns; these variations can be smoothed out or eliminated by feeding identical elements at 90 degrees in phase quadrature (commonly called turnstile configuration). Such turnstile antennas will exhibit circular polarisation throughout their entire hemi-spherical radiation pattern.

References

1 *Computer program NEC-2, G J Bourke, Lawrence Livermore National Laboratory, 1984.*

2 *Short Vertical Antennas and Ground Systems, Ralph Holland, Amateur Radio, October 95.*

3 *The ARRL Antenna Book, 15 Edition, Publisher: ARRL, 1988.*

4 *HF Antennas for All Locations, by L A Moxon, G6XN, on page 154, publisher RSGB.*

**8 Hardy Place, Kambah ACT 2902*

Antenna	Ground	Max. Gain dBi	-3 dB Elevation	-6 dB Elevation	-9 dB Elevation	-12 dB Elevation
Sloper	[13,5]	> 2	70	52	40	10
Sloper	[80,5000]	> 3	57	10		
VK3AM L	[13,5]	0	85	70	60	50
VK3AM L	[80,5000]	> 4.5	<=30	<=45		
V	[13,5]	> 5	60	47	40	20
V	[80,5000]	> 8	60	50	45	40
Inverted L	[13,5]	> 2.5	90	40	12	
Inverted L	[80,5000]	> 3.5	<= 10			
Inverted V	[13,5]	> 4	60	40	30	10
Inverted V	[80,5000]	> 6	55	20	< 10	

Table 1 – Summary of total gain.

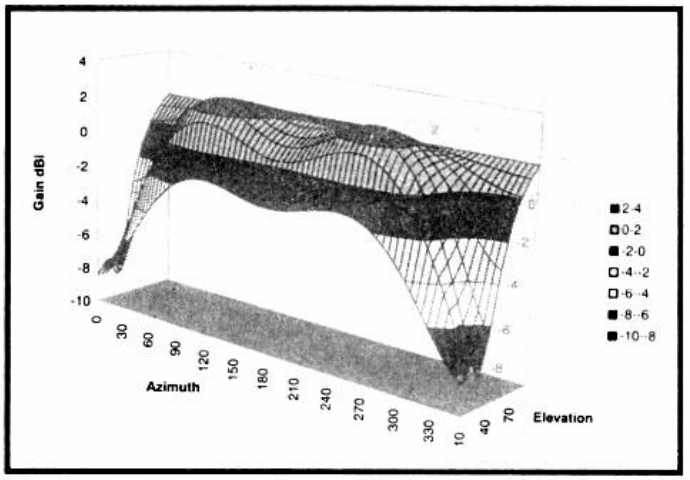


Figure 3 – Radiation pattern of sloping dipole 0.09 wavelength above average ground [13,5].

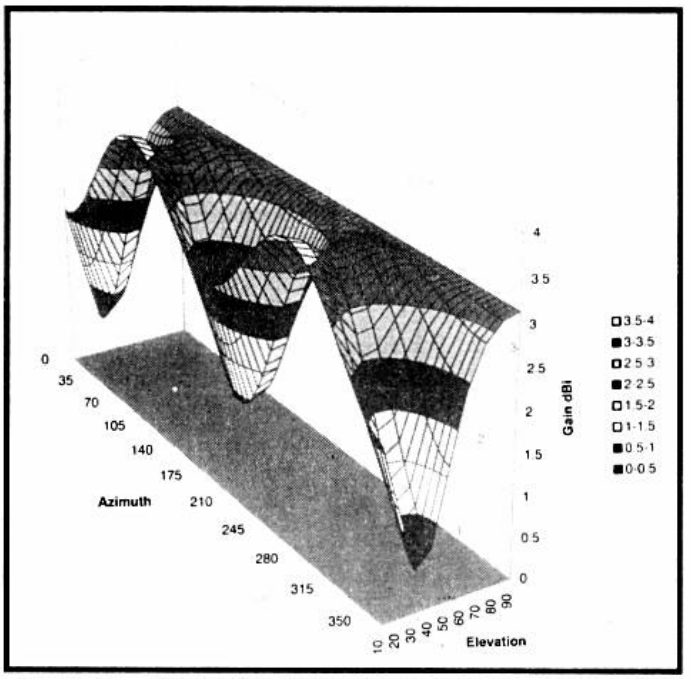


Figure 4 – Radiation pattern of sloping dipole 0.09 wavelength above sea water.

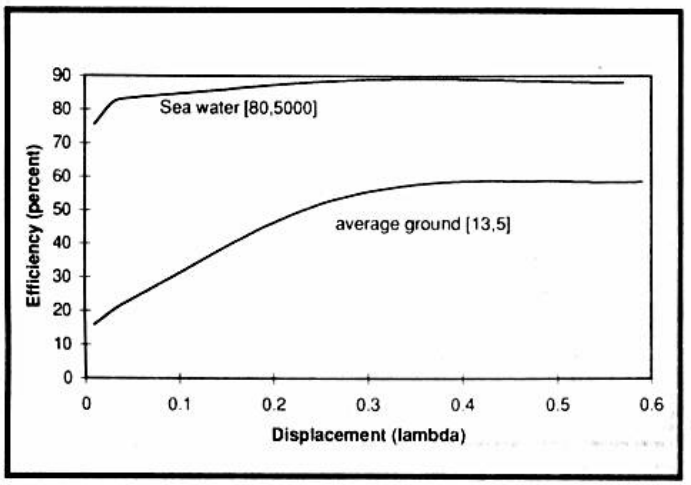


Figure 5 – Efficiency of VK3AM Marine Hybrid.

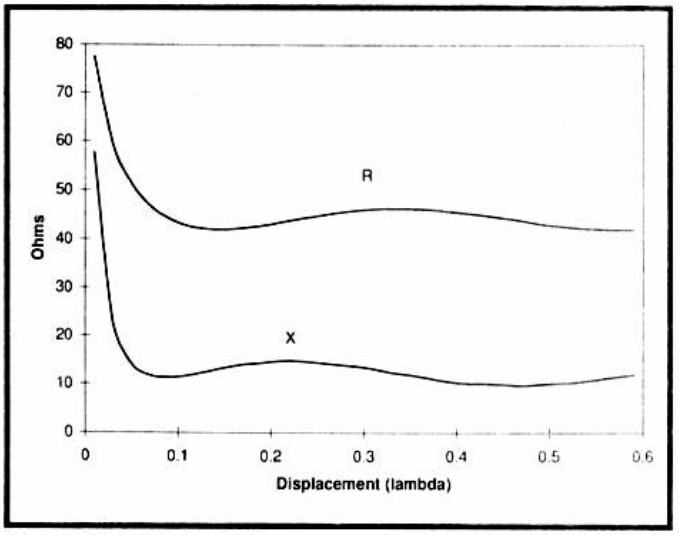


Figure 6 – Feedpoint impedance of VK3AM Marine Hybrid.

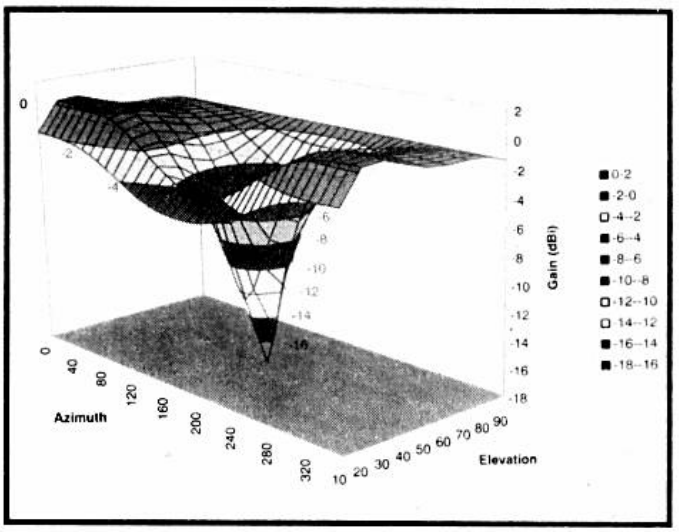


Figure 7 – VK3AM Hybrid Marine antenna 0.09 wavelength above average ground [13,5].

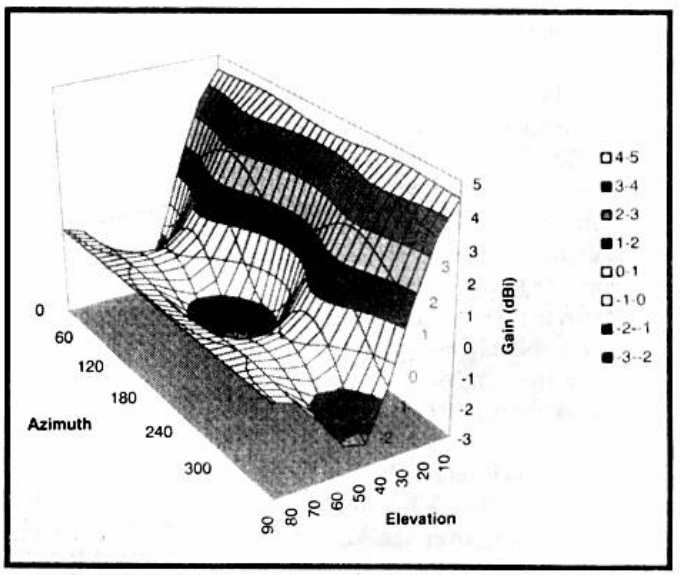


Figure 8 – VK3AM Marine Hybrid 0.09 wavelength above sea water [80,5000].

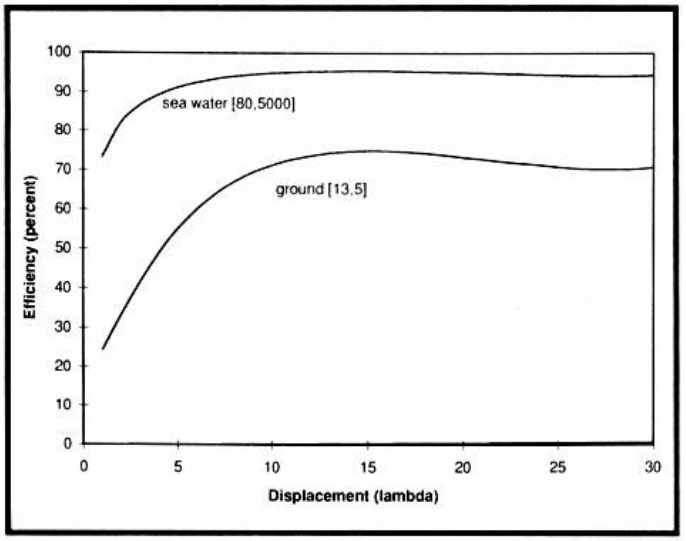


Figure 9 – Efficiency of V antenna.

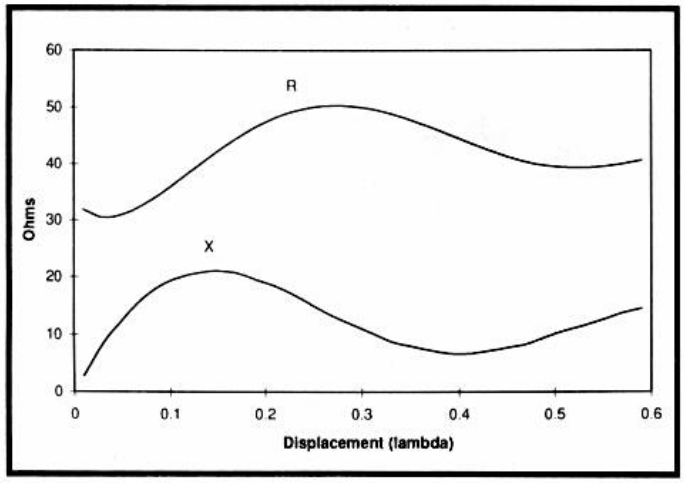


Figure 10 – V feedpoint impedance.

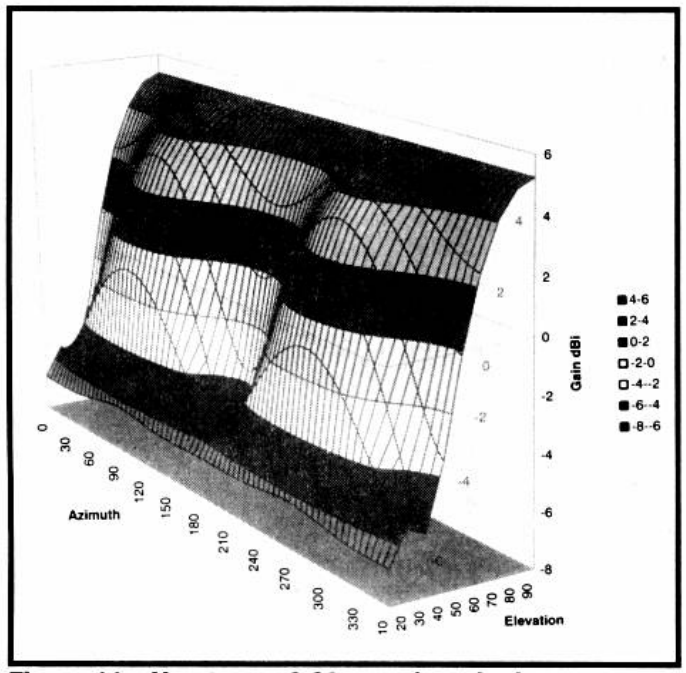


Figure 11 – V antenna 0.09 wavelength above average ground [13,5].

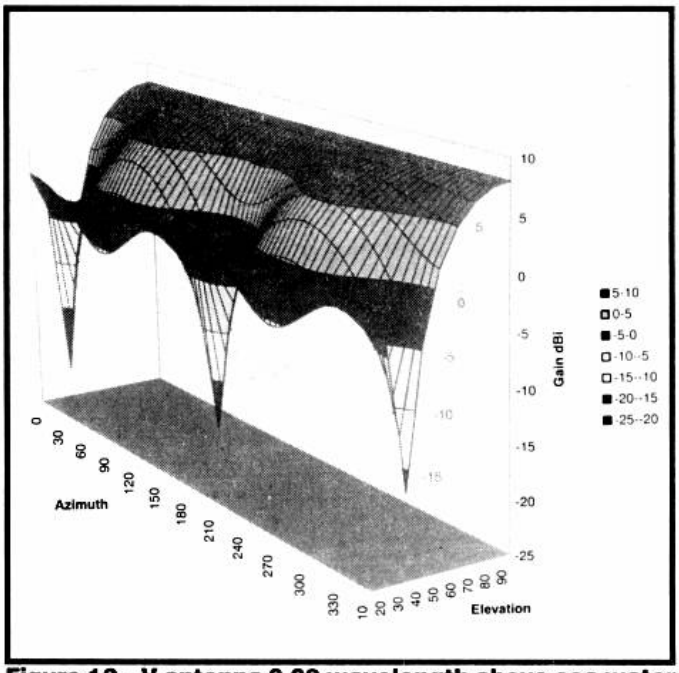


Figure 12 – V antenna 0.09 wavelength above sea water [80,5000].

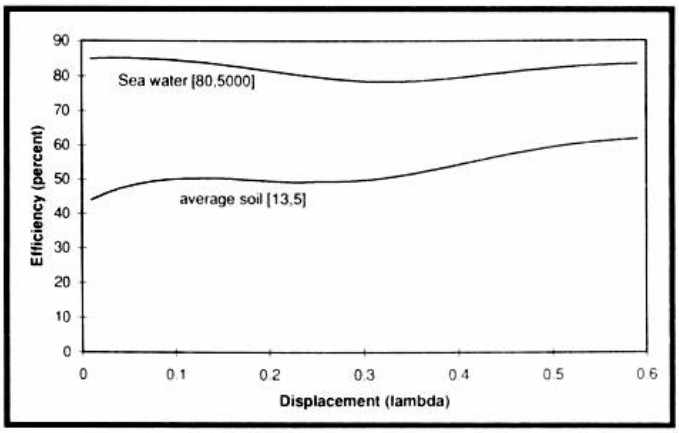


Figure 13 – Efficiency of half-wave inverted L.

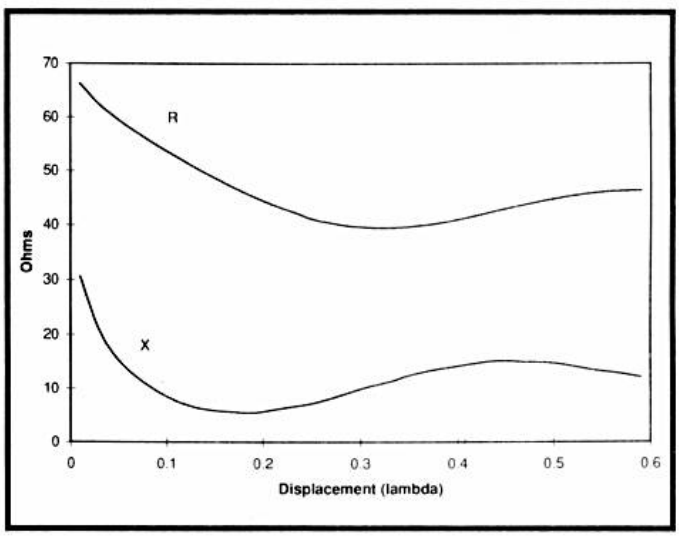


Figure 14 – Feedpoint impedance of half-wave inverted L fed at the apex above average ground [13,5].

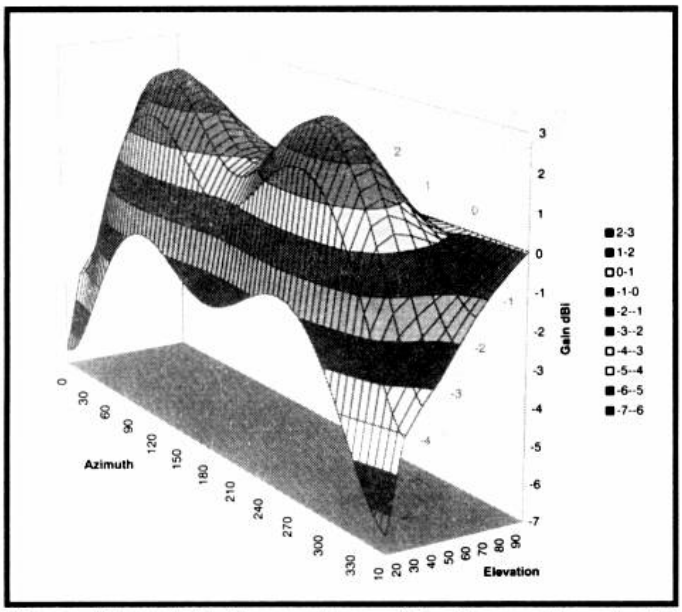


Figure 15 – Radiation pattern of half-wave inverted L above average ground [13,5].

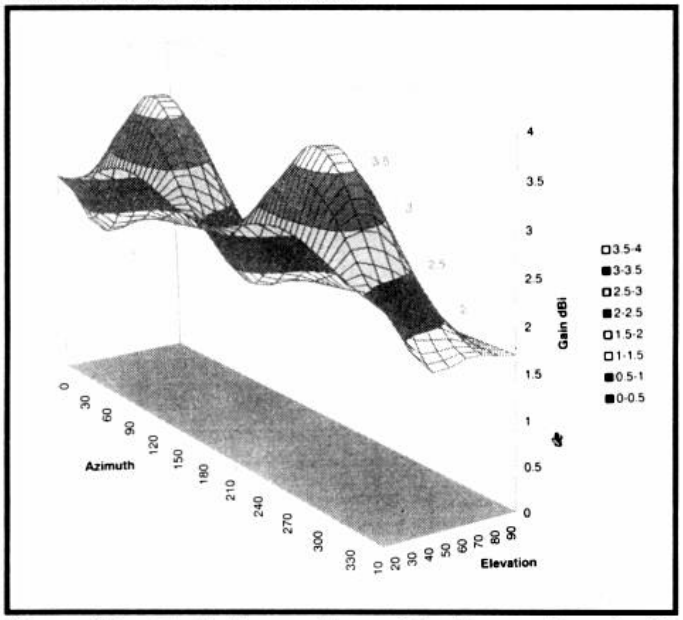


Figure 16 – Radiation pattern of half-wave inverted L above sea water [80,5000].

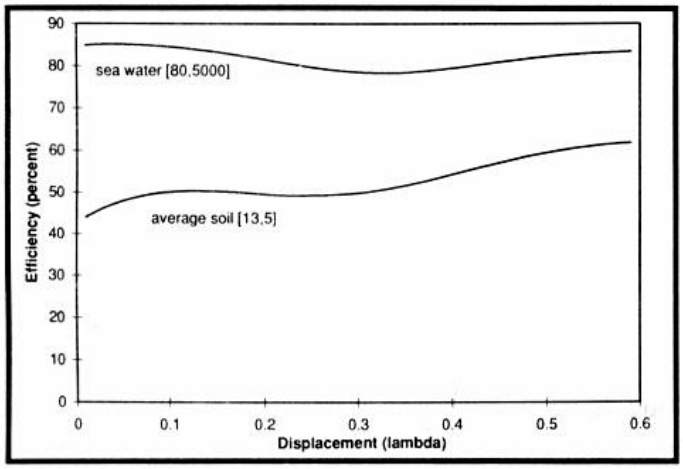


Figure 17 – Efficiency of inverted V

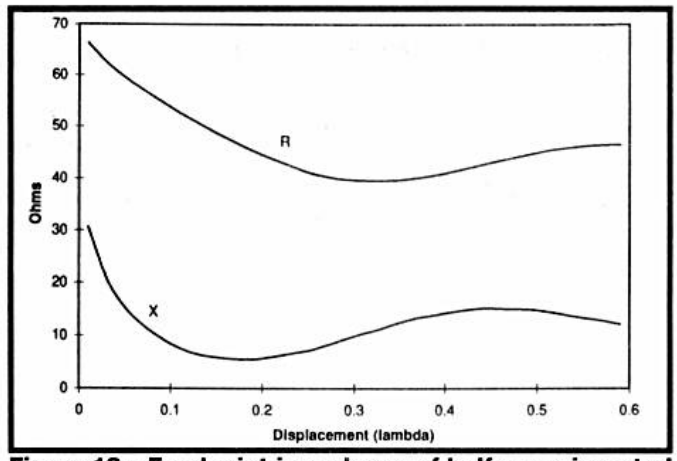


Figure 18 – Feedpoint impedance of half-wave inverted V dipole at 14 MHz above average soil [13,5]

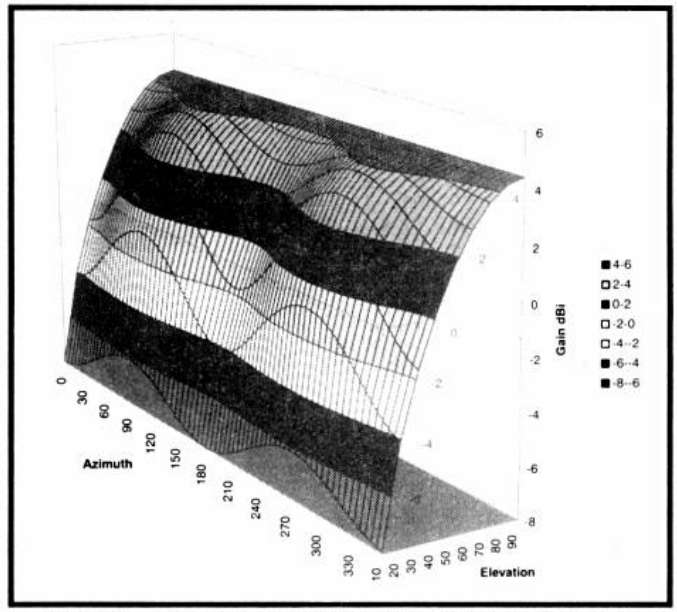


Figure 19 – Radiation pattern of half-wave inverted V above average ground [13,5].

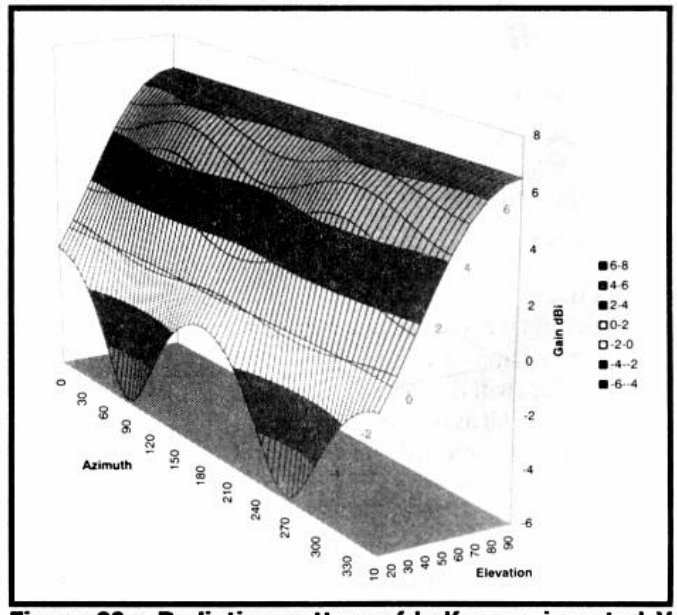


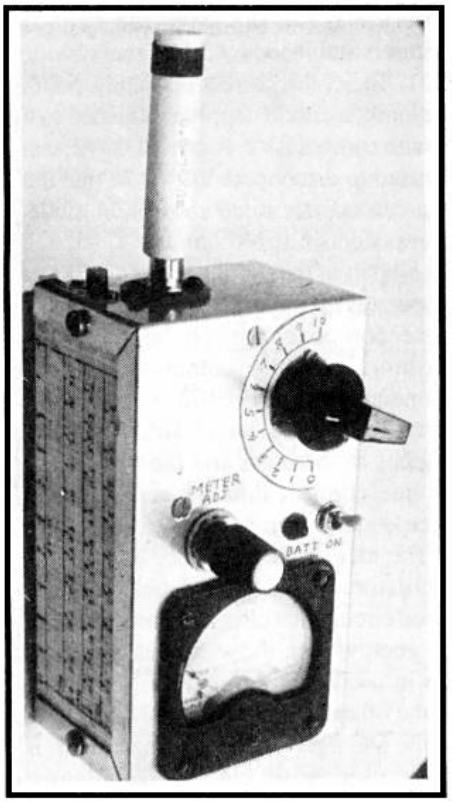
Figure 20 – Radiation pattern of half-wave inverted V above sea water [80,5000]

ar

■ Test Equipment

A Dip Meter Using the Lambda Negative Resistance Circuit

Lloyd Butler VK5BR describes a very useful piece of test equipment.*



The lambda dip meter.

Introduction

In the November 1995 issue of *Amateur Radio* I discussed negative resistance and oscillator circuits which made use of the negative resistance characteristic. One type of circuit discussed used the tunnel diode and, as a further application of this diode, many radio amateurs will remember the tunnel diode dip meter kit available in past years from the Heath Company.

These days the tunnel diode is a scarce item, probably unobtainable from the normal electronic suppliers. An alternative solid state negative resistance circuit can be achieved by interconnecting an N channel junction field effect transistor (JFET) with a P channel JFET. This has been called the Lambda circuit because its characteristic curve looks something like the Greek upper case lambda (*an upside down V. Ed*).

There have been various dip meter circuits published in radio amateur handbooks and in past issues of *Amateur Radio*. However, we haven't had one in *Amateur Radio* for some time and I thought I would introduce one around the concept of the lambda circuit. An advantage in using the negative resistance type of circuit, compared to one such as the Hartley, is that two terminal plug-in coils can be used.

I will first discuss the operation of the lambda circuit, then lead up to how an arrangement for the dip meter was devised.

As assembled, and using a range of six plug-in coils, the dip meter operates over a frequency range of 1.6 to 150 MHz. It can also be switched to operate as an absorption meter.

Lambda Negative Resistance Circuit

Field Effect transistors can be classified between those which operate in the enhancement mode and those which operate in the depletion mode.

Enhancement mode means that the FET must be biased on to set the operating point for use as an amplifier (much like biasing a bipolar transistor). Depletion mode means that it must be reverse biased, or biased off, to set the operating point (as in a valve amplifier). The Junction FET or JFET operates in the depletion mode and, to reverse bias a JFET stage, it is only necessary to insert an appropriate value of resistance in series with the source electrode (much like cathode bias in a valve stage).

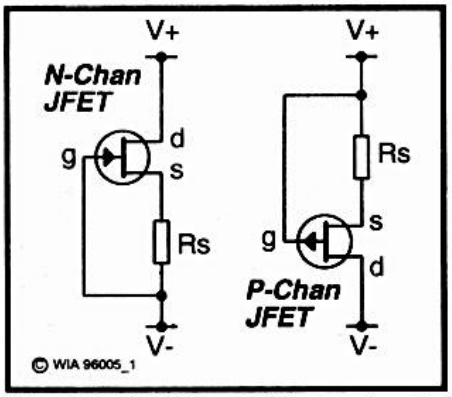


Figure 1 – Self bias, N Channel and P Channel JFETs.

Fig 1 shows a P channel JFET and an N channel JFET, each with a source bias resistor Rs. The only difference between the two circuits is the polarity in connecting to the supply rail. Voltage is developed across Rs and applied across the gate-to-source junction in reverse or depletion polarity. Due to the reverse feedback, the drain current is stabilised at a value determined by the value of Rs.

Now, instead of Rs in the P channel JFET, let's replace it with the source and drain of the N channel JFET; and instead of Rs in N channel JFET, let's replace it with the source and drain of the P channel JFET. We now get the circuit of Fig 2, and this is our lambda circuit. Connected in this way, the two transistors interact with each other and produce an interesting characteristic.

The curve of Fig 3 shows the drain current versus drain-to-source voltage, which I plotted for an N channel MPF102 transistor and a P channel 2N4342 transistor connected in the lambda circuit. Up to point A, the drain current increases as the voltage is

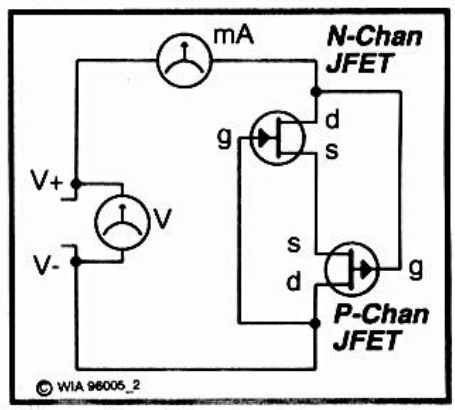
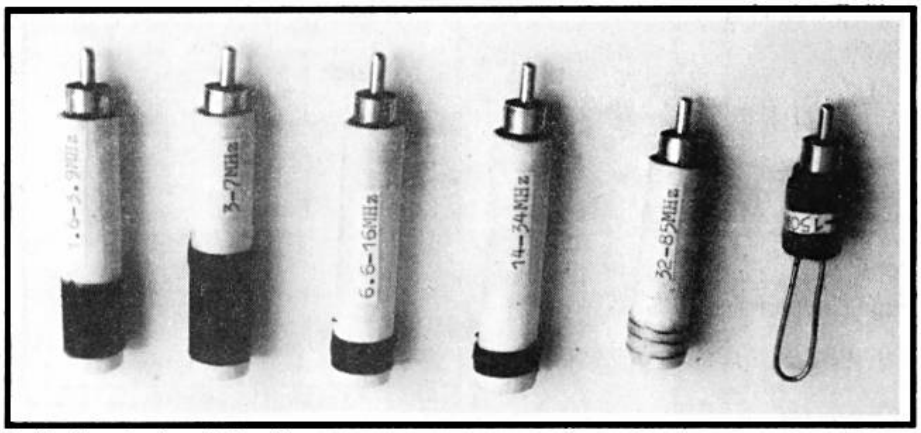


Figure 2 – The lambda negative resistance circuit.



Coils for the lambda dip meter.

increased. Beyond point A, the current then decreases, with further voltage increase creating a negative slope and the negative resistance region A-C. The amount of resistance can be scaled off by taking the ratio of voltage change to current change along curve A-C and this is a value of around minus 600 ohms.

To make a negative resistance oscillator, we simply connect a tuned circuit in series with the lambda circuit, and the drain-to-source supply, and set the supply voltage at, say, point B, around four volts. Provided the parallel resistance of the tuned circuit at resonance is somewhat greater than 600 ohms, the circuit will oscillate and the oscillator circuit formed becomes the basis for our dip meter.

In principle, it is similar to the tunnel diode dip meter, but different because it requires around four volts as compared to the tunnel diode voltage of somewhat less than one. For more detail on the theory of negative resistance oscillators, I refer you to my article in November 1995 *Amateur Radio.*

Dip Meter Circuit

The circuit of the dip meter is shown in Fig 4. In my circuit I have used an N channel MPF102 (V1) and a P channel 2N4342 (V2). I was hoping to make my unit work well up into the VHF region, and there were a number of readily available and suitable N channel JFET transistors which could have been used. I selected the MPF102 because I happened to have these. P channel JFETs seem to be more scarce and the only one I could find in the catalogues of the usual retail outlets was the 2N4342.

I was a bit dubious about using the 2N4342 as it was shown in my data sheets as a general purpose transistor and there was nothing to indicate how it might perform at high frequencies. With little else to choose, I bought some of these and gave them a try in the lambda oscillator circuit. As it turned out, I was able to make the circuit work at frequencies as high as 200 MHz.

To cover the tuning range in conjunction with plug in coils, a 100 pF variable capacitor (C2) is used. The only limitation is that, on the top VHF band, the maximum setting of this capacitance must be limited to about 45 pF, as the circuit, at these frequencies, will stop oscillation if too much capacitance is used.

The dip meter operates from a 9 V battery and the supply to the lambda circuit is stabilised by 5.1 V zener diode ZD1. To set the correct operating point, the lambda circuit supply is adjusted to 4 V with trimpot RV1. A switch, SW1, can be used to disconnect V1-V2 so that the unit can operate in an absorption mode. Components C1, SW1, V1, V2, and C2 are all part of the oscillator circuit and, as it operates up to VHF, the lead lengths to these components must be short and earthing carefully commoned. Interconnecting the MPF102 and 2N4342 works out quite well. Turn one 180 degrees to the other and the three leads on one connect directly across to the three on the other.

The idea of the dip meter is, when its oscillator coil is placed near another tuned circuit, that circuit absorbs some of the energy from the oscillator causing a dip in oscillation level when resonance of the other circuit is found. Monitoring of the DC load current to detect a dip is often used with class C oscillators. However, the lambda oscillator works essentially in a class A mode and its load current does not vary greatly with change in level of oscillation.

To detect a dip in the oscillation level, the output voltage across the tuned circuit is monitored using a detector circuit which converts the RF voltage to a direct current to actuate a micro-amp meter or milli-amp meter. To prevent the detector loading the tuned circuit, it is coupled via a source follower stage V3, another MPF102 FET.

Two detector circuits are shown. If a 50 or 100 micro-amp meter is available, circuit A does the job. For a 1 or 2 milli-amp meter, an additional current amplifier, V4, is needed and circuit B is used. In each case, the signal is rectified

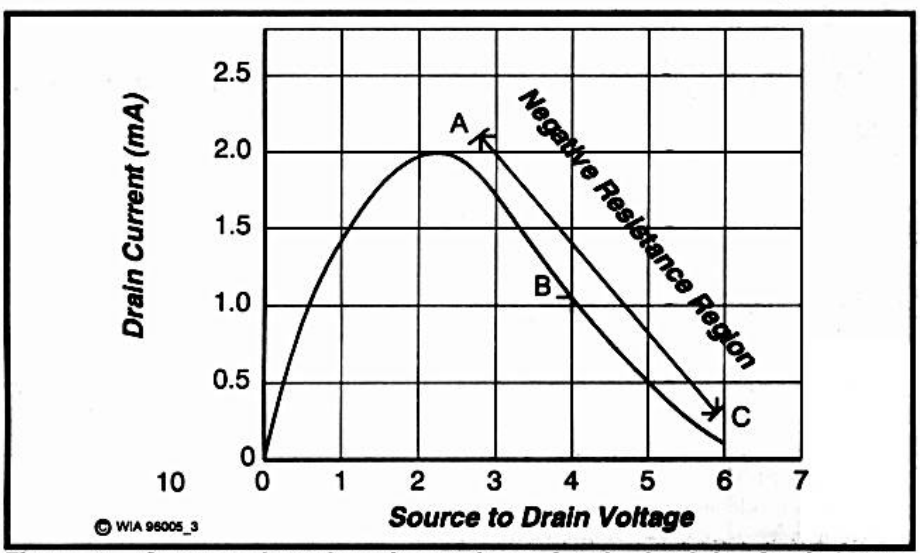


Figure 3 – Current plotted against voltage for the lambda circuit (JFETs MPF102 P Channel and 2N4342 N Channel).

and filtered by voltage doubler C5, D1, D2, C6 and the following load resistance. For V4, almost any small signal silicon bipolar NPN transistor is suitable.

In explanation of one part of circuit B, the voltage developed across diode D3 forward biases the base of V4 to compensate for the residual voltage step set by its base-emitter junction. RV2 adjusts the sensitivity of the meter circuit so that it can be set at a suitable reading level.

Load current from the 9 V battery is approximately 14 mA.

Dip

As pointed out earlier, the oscillator will work provided the shunt resistance of the resonant tuned circuit is somewhat greater than the negative resistance value of 600 ohms. Tuned circuits of even quite low Q factor have a shunt resistance of much higher than this and, hence, almost any practical inductor can produce oscillation. In effect, the feedback is greater than need be but the AC voltage developed is controlled because the voltage swing is limited by the extremities A and C on the curve in Fig 3.

As an oscillator source this is good, but it is not so good when looking for a dip in output level when some of the energy is absorbed by a circuit being measured. With so much feedback, the circuit is still able to deliver the full signal swing when energy is absorbed and, hence, there is little dip shown.

To produce a good dip, the shunt resistance of the tuned circuit is lowered to a point where the circuit just oscillates nicely and a little above the value which would stop oscillation. To achieve this condition, a resistor is shunted across the tuned circuit. As the optimum value of the resistor was found to be different for each band, the appropriate resistor for each coil is fitted at its base as part of its plug-in module. The selected value varies from 1.6 kilohm to 4.7 kilohm and no resistance at all for the top VHF band.

Coils

In making up the coils, I was influenced by the style of construction used in the Heathkit meter. A long length of small diameter tube of some form of insulating material is used. At one end, a concentric RCA type plug is fitted which mates with an RCA socket mounted on the dip meter case. At the other end, the coil is wound and the coil leads are wired back to the plug. The long thin form of module makes it convenient to poke in close to the coil to be dip tested.

Finding a source of supply of small diameter insulating tube seemed to be a problem. Eventually I found a source of 0.5 inch (12.7 mm) diameter polystyrene tube at a local hobby train shop and this was ideal for the job. For the four coils

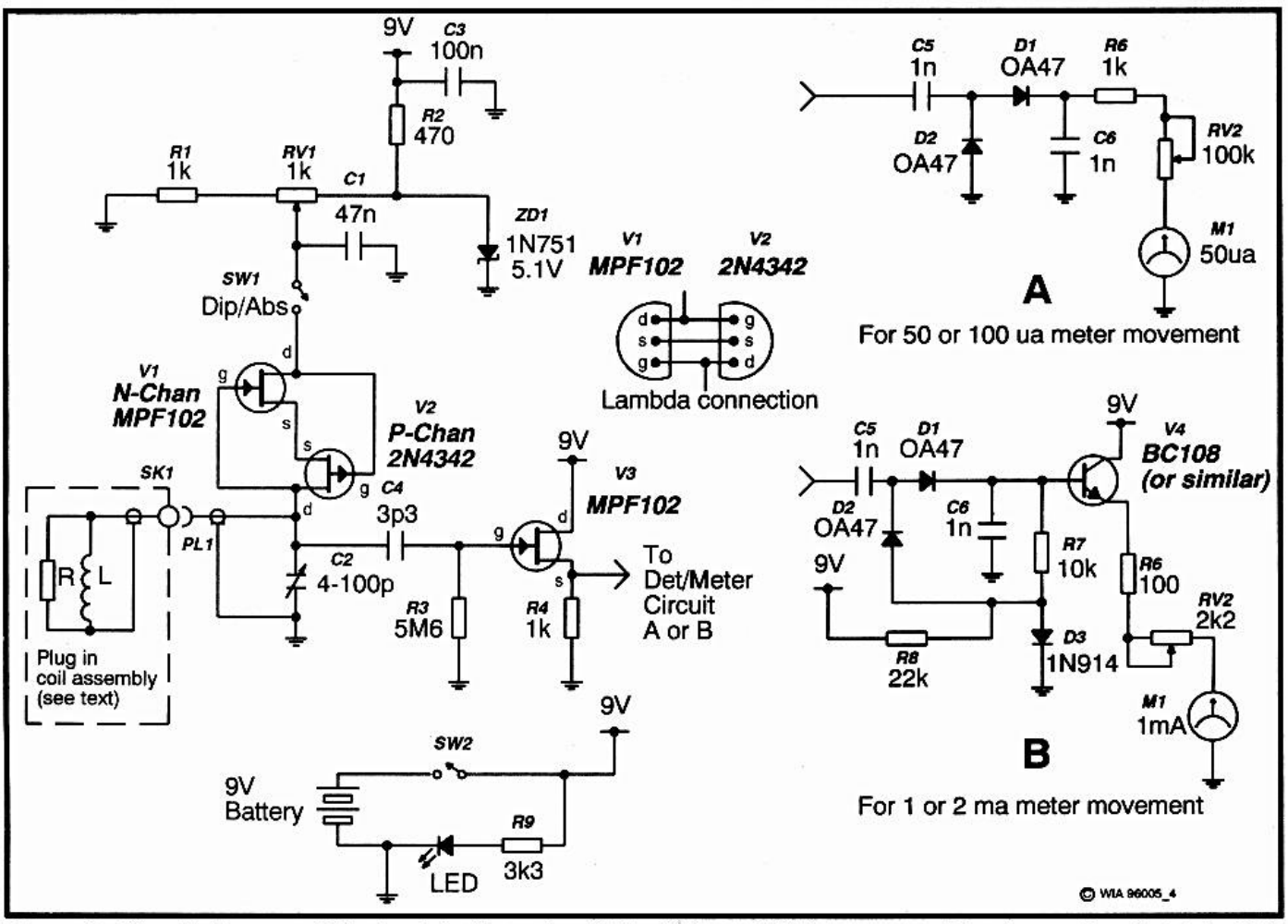
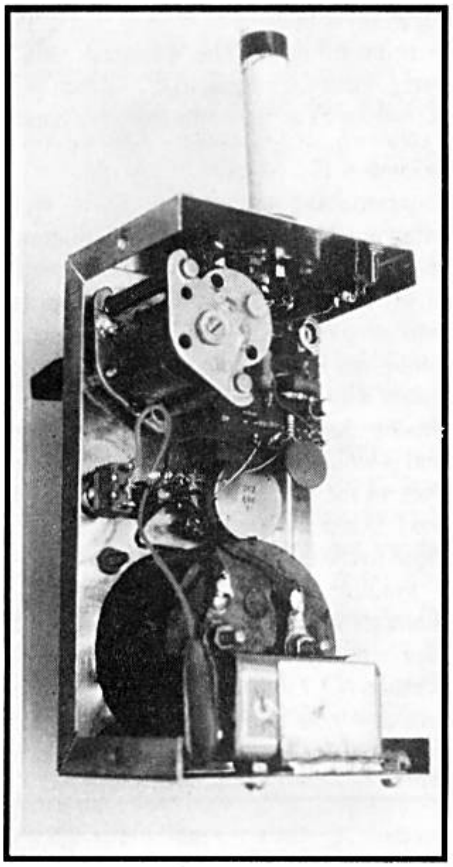


Figure 4 – Circuit diagram of the lambda dip meter. SK1 – PL1 are RCA type concentric plug and socket. The RV1 trimpot is set to 4 V



The lambda dip meter with the cover removed.

which covered 1.6 to 34 MHz, I cut the tubing to a 57 mm length. For the 32 to 85 MHz coil, where the length of the wire from coil to plug was an accountable part of the total inductance, I reduced the tube length to 46 mm. For the highest VHF band, there is no former and the inductor is just a wire loop.

Coils are wound on the tube with the active end 3 mm from the tube end. The winding detail is shown in Chart 1. The ends of the coils are passed to the inside of the tube through holes drilled in the tube. A small amount of fast Araldite *(trade name of Ciba-Geigy Corp)* fixes the end turns in place.

I stress the small amount as I tried smothering one in Araldite and found that the stray capacitance increased sufficiently to reduce the tunable range.

The RCA plastic plug cover is discarded and the resistor is soldered across the plug terminals. The leads from the coil, cut a little long, are also soldered across the terminals with the far end of the coil connected to the centre pin and the near end to the outer sleeve.

The remaining part of the plug assembly, with resistor and wires attached, is pushed into the tube as far as it can go without covering the plug connecting section. If necessary, the insulating material around the plug can be filed down to fit the tube. One version of the RCA plug I had on hand fitted nicely, but a new more recently purchased version had to be filed. The plug is cemented in the tube with Araldite.

Absorption Mode

With no shunt resistors across the coils, the instrument is very sensitive and has sharp tuning when operating in the absorption mode. Unfortunately, the need to add the resistors for the dip mode reduces the sensitivity and broadens the tuning in the absorption mode. The effect is most noticeable on the lowest two frequency bands. This is an unfortunate disadvantage, but one could easily make some extra coils without the resistor for absorption use on the low frequency bands.

In an effort to improve sensitivity in the absorption mode, I experimented with another scheme. The idea was to leave the lambda circuit in place for absorption mode and switch in a further shunt resistance sufficient just to stop the circuit from oscillating. The circuit then operated as a regenerative amplifier, increasing the sensitivity and raising the effective Q to make it sharper. A shunt resistance value of 2700 ohms was found to be suitable at HF but this had to be decreased to 1800 ohms at VHF to stop oscillation.

The idea worked quite well for HF, but it introduced a problem for the dip meter mode at VHF. The problem was introduced by the switch which switched out the extra resistor during dip operation. The few picofarads stray capacitance of the switch represented quite a low reactance at VHF. Hence, at these frequencies, the extra resistor wasn't really switched out and it upset VHF oscillation. Perhaps a low capacitance plug-in link in place of the switch might have been the answer, but I haven't persisted further with any tests along those lines. Anyway, I thought it was worth mentioning as a workable idea for an instrument limited to at least the HF range.

Components and Assembly

The transistor circuit components were mounted on a small piece of matrix board of the type that has printed pads at each hole. Interconnection was then hard wired between pads. I stressed earlier the need for short leads around the oscillator circuit. Tag pins connected with short straps to the lambda FET stage, and at the edge of the board, were soldered directly to the RCA socket mounted on the dip meter box housing.

At VHF a common earth can be tricky. I had the oscillator circuit earthy end connected to the dip meter case at the RCA socket. It was also connected to case via the frame of the tuning capacitor. I initially experienced some form of anti-resonance with a drop out of oscillation near the middle of the 32-85 MHz band. I added a further common from the negative battery connection on the card to the case and the problem disappeared. At HF, wiring is not critical but, as frequency is increased into the VHF region, every wire strap is an inductance which might have to be taken into account.

Most of the main components used in the dip meter I had on hand. The small aluminium box measuring 134 mm x 75 mm x 55 mm was recycled from a past project and had originally been purchased from Dick Smith Electronics.

The miniature variable capacitor (measured capacitance range of 4 to 100 pF) and the meter were other recycled components. The meter was an old one, 56 mm square with a FSD of around 2 mA and an RF amp scale. I had a nice 50 micro-amp meter but it was too large to fit into the box, so I used the smaller 2 mA one with the extra circuitry B shown in Fig 4. The meter is only an indicator and what is shown on the calibrated scale is unimportant.

Whilst I have personally used a few recycled components, those specified can be found in the catalogues of the retail electronics shops. The only questionable item is the 100 pF variable capacitor, which is a component often more easily obtained from a disposals source.

A value for the resistor across each coil has been nominated. However, in repeating the circuit construction, it is possible that the optimum value might

Chart 1 – Coil Winding Data

1.	1.6 to 3.6 MHz	110 turns 40 B&S close wound Shunt resistor 1700 ohms
2.	3 to 7 MHz	68 turns 28 B&S close wound Shunt resistor 1600 ohms
3.	6.6 to 15.5 MHz	21 turns 28 B&S close wound Shunt resistor 2000 ohms
4.	14.3 to 35 MHz	8.5 turns 28 B&S close wound Shunt resistor 2000 ohms
5.	32.3 to 86 MHz	3 turns 22 B&S spaced to 8 mm long Shunt resistor 4700 ohms
6.	70 to 155 MHz	Wire loop 20 SWG TCC Length from plug terminals – 45 mm Loop width – 6 mm (av) No shunt resistor

vary with the spread of characteristics of the two JFETs in the lambda circuit. The value might also be different if the design of the coil is changed resulting in a different coil Q. Low level of oscillation, or no oscillation at all, could indicate that the value is too low. Little indication of a dip when coupled into a resonant circuit could indicate that it is too high.

Calibration

To make the instrument useful, it must be calibrated on each tuning range against a calibrated frequency source or a calibrated frequency measuring device. The frequency source might be a signal generator or even another calibrated dip meter. The frequency measuring device might be a frequency counter or the radio shack tunable receiver.

Using a frequency counter, I found the easiest way was to place a one turn loop, connected to the counter, near the dip meter coil and then read off the frequency. Using the receiver, it is simply tuned in to find the dip meter signal. If the calibration of the receiver is not too reliable and a calibrated signal generator is available, just use the receiver as a monitor and reference the dip meter signal against that of the signal generator. There are various other alternative ways of doing the job.

The tuning dial must have some sort of scale and ideally the scale should show frequency calibration for each band. My box did not allow room for all this and I glued on a scale marked 0 to 10. The frequency scales were then plotted against the decimal scale on graph paper and glued to the sides of the box cover, three frequency bands on each side.

Summary

The lambda negative resistance circuit and its application in a dip meter has been described. Using an MPF102 and 2N4342 JFET combination, a frequency range of 1.6 to 150 MHz has been achieved. The circuit will oscillate using almost any practical inductive coil but, to get a good dip when power is absorbed from the coil, it must be carefully loaded with resistance to produce a tuned circuit of the right resonant shunt resistance.

The loading resistors reduce sensitivity and broaden the tuning when the meter is switched to the absorption mode. This mode is a secondary function but the loss of sensitivity is a disadvantage. The sensitivity can be improved by using separate unloaded coils or operating in the dip mode with the lambda circuit loaded down further below the point of oscillation.

Two metering detector circuits have been included, one for a 50 micro-amp movement and the other with additional DC amplification for a 1 or 2 mA movement.

The dip meter is a useful instrument to have in the radio shack, particularly for those radio amateurs who build or tune up their own transmitting and receiving equipment. A discussion on the uses of the dip meter has not been included as this is well written up in amateur radio manuals.

Footnote

The MPF102 and 2N4342 FET transistor pair used to obtain the curve of Fig 3, and used in the dip meter tested, were selected at random. Since writing the article, I have tested a number of other individual pairs of the transistors and have noted that, whilst each pair exhibited the negative resistance characteristic, there was a considerable spread of results relative to the curve shown in Fig 3. In fact, one particular combination had a maximum current at point A of less than 1 mA and did not want to oscillate too freely.

What I am saying is that, whilst my pair worked fine right from first go, it might be necessary to substitute one transistor or the pair if any oscillation difficulty is encountered. Also, if a voltmeter and milli-amp meter are available, it is not too difficult to set up the test circuit of Fig 2 to have a look in advance at the characteristic, and hence suitability, of any pair selected.

References

1. Lloyd Butler VK5BR – Negative Resistance Revived – Amateur Radio, November, 1995.

2. Samuel Dick – Exploring Negative Resistance: The Lambda Diode – Elektor Electronics, January, 1992.

18 Ottawa Avenue, Panorama SA 5041

ar

Amateur Radio Annual Index 1996

*Bill Roper VK3BR and Bill Rice VK3ABP**

A tremendous amount of absorbing reading was published in the WIA monthly journal *Amateur Radio* during 1996, including WIA amateur radio news, members' experiments, construction projects and experiences, and special interest columns.

If you see an item in this 1996 annual index which you want to read, and you cannot locate, or do not have that particular issue of *Amateur Radio,* back issues of the magazine are available from the WIA Federal Office to current members at $4.00 each, which includes postage in Australia.

If a back issue is no longer in stock, photocopies of articles are available to current members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The WIA is always looking for technical and general interest articles from members. For further details on how to write and submit an article about your latest construction project, experiment or amateur radio experience, refer to page 18 of the August 1992 issue of *Amateur Radio,* or contact Bill Roper VK3BR at 3 Tamar Court, Mentone VIC 3194, telephone (03) 9584 8928 during business hours, or Internet e-mail *vk3br@c031.aone.net.au*

TITLE	AUTHOR	ISSUE	PAGE
Administration			
Canadian Authorities Delegate Some Admin Ops to Amateur Co	WIA News	Oct	06
Exposure Draft of Submission	Roger Harrison VK2ZRH	Apr	28
Federal Council Plans for 1997 and Beyond	WIA News	Dec	06
Government Proposes Changes to Radcoms Act: New Authority	WIA News	Sep	03
IARU Committee Looks at Future of the Amateur Radio Service	WIA News	Jul	03
IARU Region 1 Meeting	David Wardlaw VK3ADW	Nov	04
Impact on Some Services (Beacon and Repeater Fees)	WIA News	Dec	03
Minister Agrees to Meet With WIA About Licensing Submission	WIA News	Aug	03
Multi-year Licence Fees (Correction)	WIA News	Aug	05
Multi-year Licences and Late Payment Penalties Introduced	WIA News	Jun	03
Pressure from Broadcasters on HF Bands	WIA News	Jan	42
Spectrum Manager Responds to Licensing Submission	WIA News	May	03
Spectrum Tax Rises But Licence Fees Fall	WIA News	Dec	03
Submission on Licensing Circulated to Parliamentarians	WIA News	Apr	03
Submission on Licensing: Concerns and Questions Addressed	Roger Harrison VK2ZRH	May	19
Tariffs: Minister Replies to WIA	WIA News	Oct	07
Tariffs: President Calls for Letter Campaign to Parliament	WIA News	Aug	04
Victory for Amateur Radio at WRC	WIA News	Jan	25
Why the Members are at the Top	WIA News	Feb	32
WIA Federal 1995 Annual Reports		Jul	18
WIA Federal to Embark on Marketing Campaign	WIA News	Mar	04
WIA November Meeting with SMA	WIA News	Jan	50
WIA Submission to Department of Communications and the Arts	WIA News	Oct	10
WIA Talks with SMA Resolve Some Issues	WIA News	Aug	51
World Radio Conference Strategies Decided	David Wardlaw VK3ADW	Dec	04
Antennas, Towers, Lines, Etc			
A Rotary Clothes Hoist 20 Metre Ground Plane Antenna	Neville Chivers VK2YO	Jul	25
All Band Vertical	Keith Rehe VK4KL	Mar	10
An Optimised Sloper for 80 Metres	Felix Scerri VK4FUQ	Aug	16
Antenna Comparison	Technical Abstracts	Sep	19
Beer-Can Antennas	Sakari Mattila VK2XIN	May	16
Bytes and Pieces (Miscellaneous Antenna Information)	Random Radiators	Dec	18
Compact HF Antenna	Random Radiators	Aug	19
Diplexers	Technical Abstracts	Jul	14
Helix Antenna Design Development from John Kraus W8JK	AMSAT Australia	Feb	21
Homebrew Ladder Line	Technical Abstracts	Nov	15
Horizontal Antennas Above Real Ground	Ralph Holland VK1BRH	Oct	22
Horizontal Half-wave Dipole Above a Counterpoise	Ralph Holland VK1BRH	Nov	12
How to ... Load Up a Tree or Confuse Your Contact	Steve Bushell VK3HK	Mar	19
Output Balance on the Z Match	Lloyd Butler VK5BR	Apr	10
Problems with Coaxial Connectors	Random Radiators	Aug	19
Simple and Effective Two Band ATU	Random Radiators	Mar	15
Some Useful Wire Antennas for HF – Part 1	Rob S Gurr VK5RG	Mar	22
Some Useful Wire Antennas for HF – Part 2	Rob S Gurr VK5RG	Apr	06
Some Useful Wire Antennas for HF – Part 3	Rob S Gurr VK5RG	May	11
Strip Yagis	Technical Correspondence	Sep	51
The ARRL Compendium Vols 1, 2, 3 & 4 (Book Review)	Evan Jarman VK3ANI	Jun	18
The Ground Plane Antenna	Adrian Fell VK2DZF	Jan	07
The LENFO Revisited	Ian Berwick VK3ALZ	Sep	14

TITLE	AUTHOR	ISSUE	PAGE
The Maryborough Amateur Radio Club and JOTA	Col Paton VK4BCP	Nov	17
The VK4FUQ Two Metre Strip Yagis	Felix Scerri VK4FUQ	Jun	12
The Z Match Using a Toroidal Core Coil	Lloyd Butler VK5BR	Sep	11
Triband Trap Beams Again	Random Radiators	Oct	20
Vertical Antenna Classics (Book Review)	Bob Tait VK3UI	Sep	26
VHF Antenna in a Lunchbox – The Magnetic Loop on Two Metres	Lloyd Butler VK5BR	Jan	04
When a Tower Ain't a Tower	WIA News	Feb	09
Awards			
Amateur Radio Awards 1995	QSP News	Feb	18
Australia Day Honour for Amateur	Don Hopper VK7NN	May	23
City of Wagga Awards		Nov	25
International Award for Australian Amateur	WIA News	Sep	06
OAM for VK7RN	Editor's Comment	Jul	02
OAM for VK7RN	VK7 Divisional Notes	Jul	36
RSGB IOTA Awards Program		Nov	25
VI75RAAF		Jan	31
WIA DXCC Listings		Aug	30
Wilkinson Award (VK5NY and VK6KZ)	WIA News	Mar	03
ZL 2000 Award		Dec	24
ZP Awards Program		Sep	33
Book Reviews			
Australian Amateur Radio Call Book 1997	Bill Rice VK3ABP	Dec	18
Practical Packet Radio	Gil Sones VK3AUI	Sep	24
Practical Transmitters for Novices	Evan Jarman VK3ANI	Mar	17
Shortwave Listening on the Road	Danny Vits VK3JDV	Aug	23
Test Equipment for the Radio Amateur	Bob Tait VK3UI	Jan	18
The ARRL Compendium Vols 1, 2, 3 & 4	Evan Jarman VK3ANI	Jun	18
Vertical Antenna Classics	Bob Tait VK3UI	Sep	26
Computers and Programs			
CAD Drawing	Repeater Link	Nov	42
Maidenhead Locator Program	John Martin VK3KWA	Dec	16
TST Host	Packet World	Jul	41
Contests			
11th Australasian CW and Phone Sprints		Jun	26
1996 Remembrance Day Contest Opening Address		Sep	17
20th West Australian Annual Contest		Jun	27
Addendum to Ross Hull Contest Rules		Jan	34
ALARA Contest Rules		Oct	32
ANARTS WW RTTY Contest 1995 Results		Jan	34
Commonwealth Contest 1995 Results		Jan	35
Commonwealth Contest 1996 Results		Nov	31
First South Pacific 160 m Contest Results		Dec	27
Jack Files Memorial Contest 1996 Results		Nov	31
John Moyle Contest 1996 Rules		Feb	25
John Moyle Field Day Contest 1996 Results		Aug	32
Maidenhead Locator		Mar	35
Remembrance Day Contest 1996 Results		Dec	30
Remembrance Day Contest 1996 Rules		Jul	33
Ross Hull Contest 1995-6 Results		May	33
VHF-UHF Field Day 1996 Results		May	34
VK Novice Contest 1996 Results		Oct	33
VK-ZL-Oceania DX Contest 1996 Rules		Aug	33
VK/ZL/O DX Contest 1995 Results		Apr	25
WIA VK Novice Contest 1996 Rules		May	32
Digital Communications			
A Radio Amateur's Guide to the World Wide Web	Richard Murnane VK2SKY	Jul	21
Getting on the Net	Will McGhie VK6UU	Aug	21
Internet	Repeater Link	Oct	47
Internet Repeaters	Repeater Link	Dec	46
NET/ROM	Packet World	Aug	44
Practical Packet Radio (Book Review)	Gil Sones VK3AUI	Sep	24
ROSE – A Brief Overview	Packet World	Nov	38
TCP/IP and AX25 Protocols	Packet World	Jun	40
TST Host	Packet World	Jul	41
EMC			
Changing Frequency	Repeater Link	Mar	46
EMC Highlighted at Sydney Conference and Workshops	WIA News	Jul	05
EMC Standards and the Homebrewer	WIA News	May	10
EMC Standards Compliance Deadline 1 January	WIA News	Jan	17
Government Study into Electromagnetic Energy Health Hazards	WIA News	Dec	05

TITLE	AUTHOR	ISSUE	PAGE
Interference on 160 m Notified to SMA	WIA News	Oct	05
Pager Notch Filter	Technical Abstracts	Nov	14
Reprieve for 6 m from Radar Interference	WIA News	Jul	04
US RF Safety Standards Affect American Amateurs	WIA News	Sep	32
Equipment Reviews			
Alinco DX-70 HF/6 Metre All Mode Transceiver	Ron Fisher VK3OM	Mar	05
Dick Smith D-3800 Power Supply	Ron Fisher VK3OM	Jul	16
ICOM IC-2350H Dual Band FM Transceiver	Paul McMahon VK3DIP	Feb	10
Kenwood TS-870 All Mode HF Transceiver	Ron Fisher VK3OM	May	06
The Yaesu FT-1000MP All Mode HF Transceiver	Ron Fisher VK3OM	Aug	07
Yaesu FT-3000M (VHF/UHF Transceiver)	Paul McMahon VK3DIP	Dec	08
Yaesu FT-8500 Dual Band FM Transceiver	Paul McMahon VK3DIP	Nov	09
Yaesu FT-900 All Mode HF Transceiver	Ron Fisher VK3OM	Jul	06
Yaesu FT51R Dual Band Handheld Transceiver	Ron Fisher VK3OM	Jun	13
Yaesu MD-100A8X Desk Microphone	Ron Fisher VK3OM	Oct	16
History			
A Decade of Change	WIA News	Feb	16
A Visit to Newt W1BCR	George Cranby VK3GI	Aug	23
Frank Hine VK2QL	Susan Hine	Apr	17
HF DF	Lee Hitchins VK6HC	Mar	18
Mission Accomplished (Os Mingay)	Wilbur Wright	Sep	24
More Early Women in Radio in Australia	Christine Taylor VK5CTY	Nov	16
Our Mrs Mac	Christine Taylor VK5CTY	Feb	14
Television 110 Years Ago!	Bill Rice VK3ABP	Feb	12
The Maunder Minimum	Paul Clutter VK2SPC	Oct	21
Miscellaneous Technical			
Bencher Paddle History, Mechanics and Adjustments	Pounding Brass	Nov	41
Buzzer Noise Source	Technical Abstracts	Apr	18
Choice of Toroid Cores	Technical Correspondence	Dec	47
Connector Troubles	Technical Abstracts	Mar	13
Conversion Chart (dB, power, etc)	Technical Abstracts	Aug	18
CTCSS Decoder (NE567)	Repeater Link	Sep	45
Dick Smith D-3800 Power Supply (Review)	Ron Fisher VK3OM	Jul	16
Flashover Protection	Technical Abstracts	Jun	16
Golden Section Morse Key Construction (Part 1)	Pounding Brass	May	46
Golden Section Morse Keys	Pounding Brass	Jul	50
Improved Stopband of Crystal Lattice Filters	Technical Abstracts	Mar	14
"Miser's" 13.8 V 10 or 20 A Power Supply	Drew VK3XU and Ray VK3RD	Dec	11
Simple ACS Reception	Technical Abstracts	Mar	13
Solar Panel Detector	Repeater Link	Dec	45
Some Thoughts on "Ham Band" Audio	Felix Scerri VK4FUQ	Jul	50
VFO Stabiliser Circuit	Technical Abstracts	Oct	18
VFO with ALC	Technical Abstracts	Jan	13
Operating			
1995 WIA Victorian Fox-Hunting Championships	Jack Bramham VK3WWW	Mar	11
A Day on an Antarctic Island	Ralph K0IR and Stephen VK2PS	Sep	21
Australia Day Honour for Amateur	Don Hopper VK7NN	May	23
Heard Island DXpedition Put Back 12 months	WIA News	Jan	30
Incident at Tarawa	"Blue" Easterling VK4BBL	Jun	19
Is Your Mobile Gear Insured?	Michael Krochmal VK3KRO	Apr	12
Lost in Ballarat	Alex Edmonds VK3BQN	Jul	24
Radio Sports (ARDF) Comes to Townsville	Iain Morrison VK4IGM	Sep	07
Satellite Frequency and Mode Update	AMSAT Australia	Jan	26
Six Monthly Amateur Radio Satellite Frequency & Mode Update	AMSAT Australia	Aug	26
Success for Region 3 Direction Finding Championships	WIA News	Aug	05
The Maryborough Amateur Radio Club and JOTA	Col Paton VK4BCP	Nov	17
The South East Radio Group (SERG) Annual Convention	Alex Edmonds VK3BQN	Mar	20
VK2COF Aeronautical Mobile	David Coffey VK2COF	Nov	19
What to Look For in a Paddle	Pounding Brass	Oct	45
WIA DXCC Standings	Awards	Feb	22
People			
Australia Day Honour for Amateur	Don Hopper VK7NN	May	23
Frank Hine VK2QL	Susan Hine	Apr	17
Mission Accomplished (Os Mingay)	Wilbur Wright	Sep	24
Our Mrs Mac	Christine Taylor VK5CTY	Feb	14
RAOTC Special VK6GM 92nd Birthday Celebration	Clem Patchett VK6CW	Mar	09
Two Friends, a Cat and a Classic Wooden Boat	Maxine Godley	Jun	20
VK2LAD	Cover	Jan	01
Places			
Croker Island NT – VK8	How's DX	Jun	34

TITLE	AUTHOR	ISSUE	PAGE
Heard Island VK0	How's DX	Apr	33
International Travel Host Exchange	Ash Nallawalla VK3CIT	Mar	25
Lacepede Islands – VK6ISL – OC-214	How's DX	Jul	36
Macquarie Island	How's DX	Jan	39
Macquarie Island VK0WH	How's DX	Feb	34
Sable Island – CY0AA	How's DX	Jun	34
Propagation			
Bottom of the Cycle?	How's DX	Jun	34
Cycle 22 Minimum?	How's DX	Dec	37
Ionospheric Update	Evan Jarman VK3ANI	Feb	51
Ionospheric Update	Evan Jarman VK3ANI	May	47
Ionospheric Update	Evan Jarman VK3ANI	Aug	46
Long-Distance VHF Ducting Opportunities from Australia	Emil Pocock W3EP	Aug	12
Progress of Cycle 23	VHF/UHF An Expanding World	Mar	51
Propagation and Ionospheric Data on the World Wide Web	WIA News	May	15
Solar Cycle Minimum Near	WIA News	Feb	30
Sunspot Cycles	How's DX	May	38
The Great Tropospheric Opening (Part 1)	VHF/UHF – An Expanding World	Apr	48
The Great Tropospheric Opening (Part 2)	VHF/UHF – An Expanding World	May	48
The Maunder Minimum	Paul Clutter VK2SPC	Oct	21
Receivers			
Experimental Receiver for Two Metres FM Using a Car Radio	Peter Parker VK1PK	Jul	10
Receiving Converter for 6 Metres	Drew Diamond VK3XU	Oct	08
Regulations			
80 m DX window	WIA News	Jan	50
Autopatch	Repeater Link	Jan	44
Changes to High Power Operations	WIA News	Dec	07
FM on the HF Bands	WIA News	Mar	04
New Licence Conditions	WIA News	Aug	16
Overseas Visiting Amateurs Can Pay Lower Licence Fee	WIA News	Oct	21
Progress on Special Olympic Callsigns	WIA News	Oct	05
Understanding Our New Licence Conditions	John Martin VK3KWA	Feb	04
Working Group Tackles 80 m DX Window Expansion	WIA News	Oct	27
Repeaters and Beacons			
Autopatch	Repeater Link	Jan	44
Changing Frequency	Repeater Link	Mar	46
CTCSS Decoder (NE567)	Repeater Link	Sep	45
CTCSS Encoder	Repeater Link	Jul	46
CTCSS Encoder Mk 2	Repeater Link	Aug	48
Internet Repeaters	Repeater Link	Dec	46
Link Timer	Repeater Link	Apr	45
VK5VF VHF/UHF/SHF Beacons	Eric Jamieson VK5LP	Feb	48
Test Equipment			
A Cheap QRP RF Power Meter	Random Radiators	Aug	20
Buzzer Noise Source	Technical Abstracts	Apr	18
Noise Generator	Technical Abstracts	Oct	19
RF Impedance Bridge	Technical Abstracts	Oct	19
Test Equipment for the Radio Amateur (Book Review)	Bob Tait VK3UI	Jan	18
Transceivers			
Alinco DX-70 HF/6 Metre All Mode Transceiver (Review)	Ron Fisher VK3OM	Mar	05
Comparison of 2 Metre Handhelds	Technical Abstracts	Aug	17
Comparison of Dual Band Handhelds	Technical Abstracts	Jan	14
Dual Band Mobile Comparison	Technical Abstracts	Apr	18
ICOM IC-2350H Dual Band FM Transceiver (review)	Paul McMahon VK3DIP	Feb	10
Kenwood TS-680S HF/6 m Transceivers (35-45 MHz reception)	Technical Correspondence	Oct	36
Kenwood TS-870 All Mode HF Transceiver (review)	Ron Fisher VK3OM	May	06
"Little Mate" CW Transceiver for 3.5 and 7 MHz	Drew Diamond VK3XU	Jun	05
The Yaesu FT-1000MP All Mode HF Transceiver (Review)	Ron Fisher VK3OM	Aug	07
Use of IC-735 HF Transceiver for QRP Operation (Try This)	Simon Buxton VK2EII	Aug	24
Yaesu FT-3000M (VHF/UHF Transceiver) (review)	Paul McMahon VK3DIP	Dec	08
Yaesu FT-8500 Dual Band FM Transceiver (review)	Paul McMahon VK3DIP	Nov	09
Yaesu FT-900 All Mode HF Transceiver (Review)	Ron Fisher VK3OM	Jul	06
Transmitters			
A Micropower Two Metre FM Transmitter	Peter Parker VK1PK	Nov	06
Basics of Transmitters – Part One	Novice Notes	Oct	41
Basics of Transmitters – Part Two	Novice Notes	Dec	40
The Garran 40 m CW QRP Transmitter	Peter Parker VK1PK	Jan	10

3 Tamar Court, Mentone VIC 3194
Internet e-mail: vk3br@c031.aone.net.au
ar

■ Technical

Technical Abstracts

*Gil Sones VK3AUI**

Quadrifilar Helix Antenna

In August 1996 *QST*, Eugene F Ruperto W3KH described the construction of Quadrifilar Helix aerials. These are used to provide a fixed aerial which provides good omni-directional sky coverage for receiving satellite signals. This is of use for receiving signals from low earth orbit weather satellites and amateur satellites using Molniya type orbits. The antenna is circularly polarised and a 140 degree beam width is claimed with useful signals received to within 10 degrees of the horizon. This allows a fixed antenna to provide useful signals from most passes of a satellite. The antenna is circularly polarised so you must pick the correct polarisation rotation.

The antenna construction is shown in Fig 1. The polarisation is set by the winding of the helices. For right hand circular polarisation the helices are wound counterclockwise as viewed from the top. Similarly, for left hand circular polarisation the helices are wound clockwise as viewed from the top. This is different from conventional axial mode helix construction.

One of the helixes is the phasing line and is made from RG8/RG213 coaxial cable. The other wires are #10 which is approx 3 mm diameter. The connections at top and bottom are shown in Fig 2. The central support is two inch diameter schedule 40 PVC pipe. The cross supports are half inch diameter PVC tubing. The PVC tubing was initially tested for suitability by subjecting samples to a one minute test in a microwave oven. If there is no significant heating then they are OK to use. It would be prudent, however, to place a beaker of water inside the microwave oven with the samples to provide some loading for the oven. If the sample heats significantly, then look for some alternative PVC pipe.

The antenna dimensions for both weather satellite use and amateur use are given in Table 1. The loops are different lengths to provide correct phasing. One has positive reactance and the other has negative reactance making up the feed impedance and achieving the correct phasing.

For those interested in this form of antenna, the *QST* article gives some references. The RSGB Handbook shows alternative feed arrangements for this type of antenna but without detailed practical constructional information.

Replacement 572Bs for Yaesu FL2100

Replacement of the valves in the Yaesu FL2100 series linear amplifier has been somewhat difficult. The original valves have become scarce and expensive. However, replacement 572Bs have become available from another source, manufactured in Russia. These are branded Svetlana and the address of the Svetlana distributor in the USA is Svetlana Electron Devices Inc, 3000 Alpine Road, Portola Valley, California, 94028, USA. There are local distributors and the 572B is listed by Daycom Communications Pty Ltd.

In *Technical Topics* in the October 1996 issue of *Radio Communications*,

Table 1 – Quadrifilar Helix Antenna Dimensions

Freq	Wavelength	Small Loop			Big Loop		
MHz	inches	Leg Size	Diameter	Length	Leg Size	Diameter	Length
		0.508	0.156	0.238	0.560	0.173	0.26
137.5	85.9	43.64	13.4	20.44	48.10	14.86	22.33
146	80.9	41.09	12.6	19.25	45.3	14.0	21.03
436	27.09	13.76	4.22	6.44	15.17	4.68	7.04

All dimensions are given in inches as in the QST article.

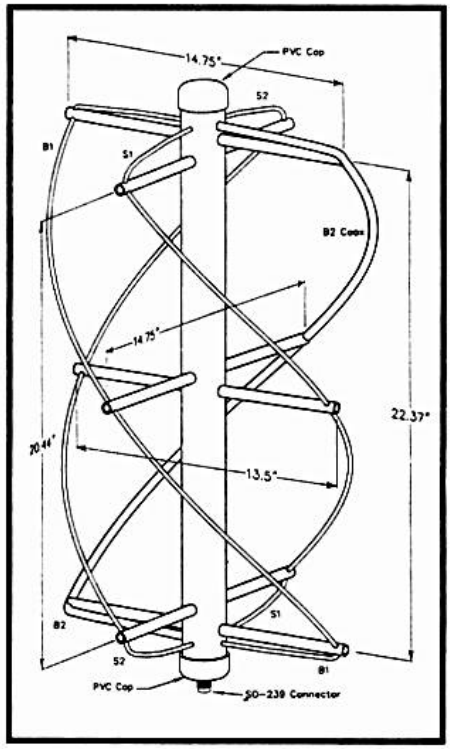


Fig 1 – Quadrifilar Helical Antenna, identifying the individual legs.

Pat Hawker G3VA provides some information he received in a letter from George Badger W6TC of Svetlana concerning the replacement of 572Bs in Yaesu linears. The Svetlana 572Bs have slightly higher gain than the original 572Bs which can result in oscillation in the standby mode. The bias in the Yaesu FL2100 series needs to be increased for the Svetlana replacements to avoid this problem.

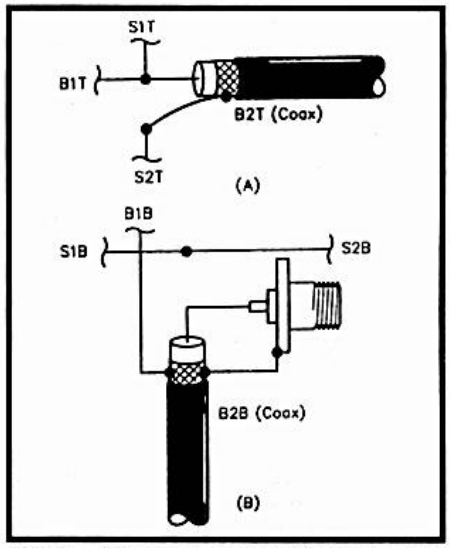


Fig 2 – Element connections to the QHA: (A) shows the connections at the top; (B) shows the connections at the bottom.

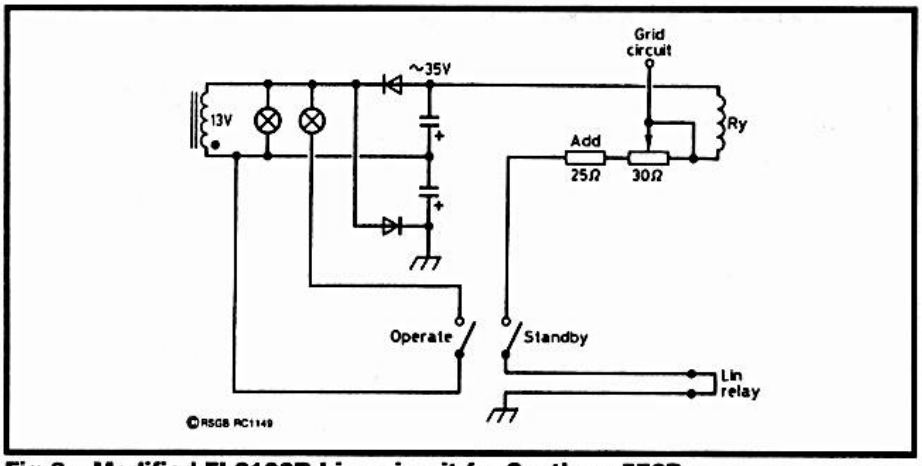


Fig 3 – Modified FL2100B bias circuit for Svetlana 572Bs

George W6TC has modified an FL2100B to provide a higher voltage cut-off bias which is then stable as the amplifier valves are fully cut-off in the standby mode. He obtained the higher bias voltage by changing the bias supply to a voltage doubling rectifier circuit. The voltage is then sufficient to cut the 572Bs off in standby. A resistor was placed in series to limit the relay current in the relay which uses the same supply.

The modified circuit is shown in Fig 3.

Noise Assisted Reception

Also in the *Technical Topics* column in *Radio Communications* for October 1996, Pat Hawker G3VA draws attention to an article in the *New Scientist* of 1 June 1996, by Kathryn S Brown. The article outlines a hypothesis that, to pick up a faint message, the background noise can be a help rather than a hindrance.

The idea is that on the verge of detection the background noise assists the recognition of the weak signal which in effect rides on the noise. The system is non-linear at this time and the signal in the presence of noise can be detected.

The idea first appeared in 1981 in an entirely different field which was the melting of ice floes.

*C/o PO Box 2175, Caulfield Junction VIC 3161

ar

WIA News

Band Plans, Beacons and Bad Habits

With the summer DX season in full swing on the VHF-UHF bands, it's time to remind operators to keep the beacon segments of the bands clear at all times, and to reinforce the reasons why we have band plans.

The band plan arrangements help avoid mutual interference between otherwise incompatible modes and operations. On each band from six metres down, a segment is set aside by "gentlemen's agreement" for narrow band modes and weak signal operation. Other segments are set aside for FM and repeaters, packet radio, etc.

On two metres, for example, the segment for narrow band modes and operations is from 144.000 MHz to 144.700 MHz. The first 50 kHz is for moonbounce only, the next 50 kHz for CW and RTTY (FSK). The narrow band voice modes and CW share the segment from 144.100 MHz to 144.240 MHz. Then follows a "guard band" to 144.300 kHz, to accommodate the New Zealand 2 m beacons. Australian beacons are accommodated in the 144.400-144.600 kHz segment.

Unfortunately, some unwitting or uncaring FM operators are using that part of the 2 m band below 144.700 MHz. FM stations have been noted using the 144.100 MHz National Primary (narrow band) Calling Frequency for cross-town chit-chat. Other FM operators have been noted operating in the 144.400-144.600 MHz beacon segment. Stations pursuing weak signal and long distance operation find it particularly frustrating and annoying to hear FM stations on top of a beacon frequency. Just because an FM station in the Blue Mountains cannot hear the VK5VF 2 m beacon is not a good reason to operate on the beacon's frequency or anywhere in the beacon segment of the band.

Beacons serve a variety of useful purposes: to provide an effective indicator of propagation conditions (including weak signals), and to provide a constant "reference" signal for operators in its local area. It is just as important to have beacon frequencies free of interference when a band's NOT open, as when it is open.

There would be loud complaint if SSB or CW operators moved into the channelised FM and repeater segments and operated without regard to others.

Courtesy and respect for the band plan, which preserves the rights and interests of operators who pursue differing modes and operating practices, needs to be observed for the sake of peaceful coexistence. It takes little effort to be a "good neighbour". FM is not compatible with narrow band modes and weak signal operation, even though DX is frequently worked in the FM segments when conditions are good.

New Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of November 1996:

L21030	Mr C Donnelly
L30944	Mr H Szapirko
L30945	Mr J Austen
L60352	Mr J Timmers
L60358	Mr E Schipp
L60360	Mr M A Hynds
VK2MDS	Mr M D Smyth
VK2MPN	Mr B Dawson
VK3LJH	Mr L Hands
VK3ZMT	Mr M R Brighton
VK5ZHW	Mr R H Clogg
VK6PDV	Mr R S Duncanson
VK7BW	Mr B Welch

ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Happy New Year Everyone!

Only 1080 days to the next century (someone is sure to tell me that is wrong)! 1996 was a great year for ALARA, the highlight being the Meet in Perth which will be long remembered by all those who made the journey West to be there, and those who came from other directions.

Don't forget membership subscriptions are due this month. Details are in the October *Newsletter*, so do it NOW, and stock up on ALARA badges, charms, teaspoons, sugar spoons, stickers, bookmarks and notepaper at the same time. Send to our Treasurer Margaret Schwerin VK4AOE, PO Box 758, Dalby, Qld 4405.

Contest

The ALARA Contest was held Saturday, 9 November, with conditions on 80 m surprisingly good for that time of year. Results will be published shortly. If you have not put your log in, it is too late now. Nice to hear lots of ZLs; and Aimee FK8FA was there, of course, giving us all a bit of DX and getting a good score.

International YL Meet

During the Berlin World '96 meeting it was decided to have the next International YL Meet in 1998 in California USA. However, as the YLRL 60th Anniversary will be in 1999 and the Convention will be held in California, it was decided to have a different location for the 1998 YL Meet.

The YL '98 Meeting will now take place in Norway in Longyearbyen, Svalbard, from 20-24 August 1998. Longyearbyen is a town situated at 78 degrees north on Spitzbergen, belonging to the group of islands called Svalbard.

Accommodation and meetings will take place at the Svalbard Polar Hotel, a modern conference hotel of high standard with all facilities and excellent cuisine.

The program will include sightseeing trips with ample time for leisurely strolls and tax-free shopping. There will be an opportunity to operate amateur radio from the shack of the Svalbard Group of NRRL (Norwegian Radio Relay League) using the rare and popular prefix JW.

Besides the joy of being together with other YLs enjoying our fine mutual hobby, there will be the unique experience of wild, beautiful and pure arctic nature not far from the North Pole in daylight round the clock (dig out the thermal undies girls, this sounds great!).

If you are interested in joining the Svalbard Polar YL '98 Meeting, please write to the following address and you will be sent a formal invitation with further information and prices: Svalbard Polar YL '98, c/o Ruth Tollefsen LA6ZH, PO Box 17, Tveita, N-0617, Oslo, Norway. Other organisers are Unni Gran LA6RHA and Turid Bjerke LA9THA.

If you are really into forward planning, the Korean Ladies Amateur Radio Club are planning to host the International YL Forum in Seoul for the millennium, so pencil that in your year 2000 calendar.

Packet YL Group

A group of YLs from all over the world are looking for "OC Gals" to join them. Send a packet to Phyllis KA1JC @ WA2LKI.#VEN.FL.USA.NOAM to find out more.

14th BYLARA Contest 1997

Date: Thursday, 13 February, 1900 to 2200 UTC; Saturday, 14 February, 1000 to 1300 UTC. **Bands:** 14.250 to 14.280, 21.350 to 21.400, 28.350 to 28.410, and 28.650 to 28.700 MHz. HF Phone, VHF Phone, mixed HF/VHF Phone and SWL.

Call "CQ BYLARA Contest", OMs work YLs only, YLs work everyone. Log: Callsign, RS Serial Number (start 001 each day). **Score:** YL BYLARA member = five points, YL non-member = three points, OM Associate member = two points, other OM = 1 point. Each day is a separate entry total. Only one period of operation counts for each entry, but logs from non-scoring day are welcome as check logs. More than one section may be entered. National Society log sheets showing claimed score and declaration that entrant has abided by licence regulations, IARU band plans and above rules, are to be received by 4 April 1997. Send to: Ella Tugwell G0FIP, 67 Upper Kingston Lane, Shoreham by Sea, Sussex BN436TG, England.

Perth Again

Little items of interest keep filtering through – here are some of them.

ALARA was given a beautiful wooden plaque with 21st greetings from NZART, and ALARA President Christine VK5CTY was made an honorary member of NZART for the duration of the Meet.

The Birthday cake was ceremonially cut by Norma VK2YL, ALARA's first President.

Raija SM0HNV came to Australia specially for the meet after reading about previous Meets in the Newsletter. Sweden does not have a YL organisation at this time, the nearest one being Finland.

Three dolls attended the Meet – VK6DOL made by Norma VK6PNS, VK5GAL made by Meg VK5AOV and VK4TED a well-dressed teddy brought by Robyn VK4RL. The walking muppet VK3EMU was also there attending his third ALARAmeet. VK5GAL crossed the Nullarbor sitting behind the car windscreen so can claim to have seen quite a lot of Australia.

The two sections of ALARA's History (not to be confused with Michael Jackson's) were available for sale at the Meet, and those who missed out can obtain them from Christine VK5CTY. Part One goes from the beginning in 1975 to 1989, and Part Two covers the years 1990 to 1995.

Betty ZL1UBZ, Bob ZL1BBZ, Marion ZL3TVF and Lester ZL1VF travelled to Perth via England and Scotland where they had purchased tartan glengarries with bright red hair hanging lankly below them. These were worn on several occasions, turning heads on the streets of Perth.

Other long path travellers were Helene VK7HD and Peter VK7PR who came from Hobart via Queensland and the Northern Territory.

A word of warning – don't get into a bus with New Zealanders unless you are prepared to sing! They even produce laminated sheets with all the words, so you have no excuse for not joining in.

**C/o PO Woodstock, QLD 4816*
Tel: 077 788 642

ar

Club Corner

Radio Amateurs Old Timers Club (RAOTC)

Members are reminded that there will not be an RAOTC broadcast in January. The next broadcast will be on Monday, 3 February. The times and frequencies will be the same as for the November and December broadcasts last year, as listed on page 31 of the No 17 (November) issue of OTN (which members should have received in late November).

A number of circumstances beyond our control caused the late production of this issue of OTN. However, we have received many favourable comments about it, and can only keep up the standard we strive for if members continue to send in their contributions, either to our secretary, Arthur Evans VK3VQ, or myself. We are both QTHR.

Allan Doble VK3AMD
President
ar

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Goodbye to an Old Friend

OSCAR 13 is no more. It was launched on 15 June 1988 and the electronics ceased to operate on 24 November 1996. In that time it had become part of the amateur satellite community's way of life. It was one of the most consistent performers in the AMSAT fleet. Its transponders were a dream to operate and in many ways, for example the "S" mode transponder, it pointed the way to the future. DXCCs were not unheard of among the thousands of regular users.

Some amazing performances were chalked up during the ZRO tests. Signals as weak as 27 dB below the beacon were copied by some operators. Due to problems with the orbit, the job of the control team was quite demanding and Graham, Peter, Ian, Stacey and Karl are to be congratulated on a job well done.

Graham reported that the engineering beacon ceased transmitting during the Q block time-stamped AMSAT Day Number 6902, ie 24 Nov 96 @ 05:38:16 approximately MA 31 or 32 on Orbit Number 6481. Graham confirmed this loss of signal with Elgar VK5ED who was also monitoring the telemetry when the transmission stopped. Further attempts to command AO-13 were unsuccessful.

It had been predicted for some time now that it would re-enter the earth's atmosphere and burn up in the first week of December. At the time of writing it is still aloft. The perigee heating was extreme in the few days just before the beacon went dead and no doubt soon afterwards bits would have started breaking free. There was some evidence that the solar cells had already begun to break up. In the days immediately prior to the end the beacon carried some interesting messages. Two were of particular interest and well worth recording here.

M QST de AO-13 BIRTH ANNOUNCEMENT 1996 Nov 20 0240 EST. My child, P3D, began "thinking" today when its IHU was activated. I'm glad I lived long enough to learn of this wonderful event. I wish P3D a long, functional life. Do not grieve for me when I'm gone. I'm only metal, plastic, & sand. My "life" came from enriching the lives of those who built, commanded & utilised me, and it's been a good "life". Danke Karl, et al. No regrets. The baton will soon be passed. AO-13 signing off....

And:

*N QST ** AO-13 Only One Solar Panel Still Working ** After AO-13's last perigee (6479/6480) only solar panel #5 is still working. Therefore, all transponders have been switched off to conserve power. The Engineering Beacon will be left running with the Hi-gain antennas from MA 20 to MA 200 and with the Lo-gain (omnis) from MA 200 through perigee to MA 20. Peter/DB2OS James/G3RUH Graham/VK5AGR Stacey/W4SM*

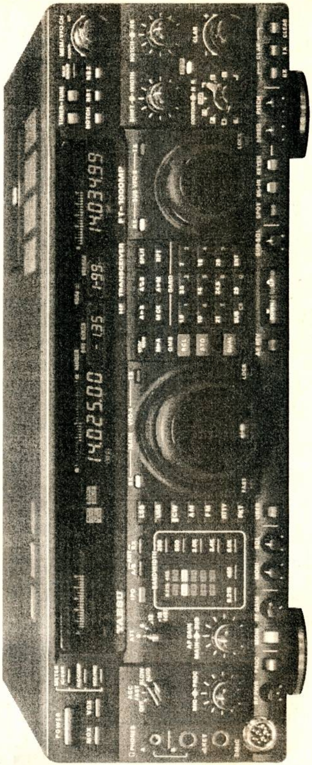
One orbit later the beacon stopped transmitting. AO-13 was dead!

Six Monthly Amateur Radio Satellite Update

Here is a list of current amateur radio satellite frequencies and modes.
Full details of the RS satellites' many modes and transponders appeared in the January 1995 *AMSAT Australia* column.

Satellite	UPLINK (MHz)	DOWNLINK (MHz)
Oscar 10 (AO-10)		
General Beacon (Carrier only)		145.808 (approx)
Mode B (SSB,CW-Inverting)	435.030-435.180	145.825-145.975
Oscar 11 UoSAT-2 (UO-11)		
Beacon (1200 AFSK,FM) telemetry/bulletin		145.826
Beacon (1200 AFSK,FM)		435.025
Beacon (1200 AFSK,FM)		2401.500
Radio Sputnik 10 (RS-10)		
Mode A (SSB,CW-Inverting)	145.86-145.90	29.360-29.400
Beacon/Robot (CW)		29.357
Beacon/Robot (CW)		29.403
Robot Mode A (CW)	145.82	29.357 or 29.403
Radio Sputnik 12 (RS-12)		
Mode A (SSB,CW-Inverting)	145.91-145.95	29.410-29.450
Beacon/Robot (CW)		29.408
Beacon/Robot (CW)		29.454
Robot Mode A (CW)	145.831/.840	29.408 or 29.454
Radio Sputnik 15 (RS-15)		
Mode A (SSB,CW non-invert)	145.858-145.898	29.354-29.394
Beacon (CW)		29.352.5
AMSAT-OSCAR-16 (AO-16) Callsign = PACSAT		
Mode J (1200 BPSK BBS,FM-SSB)	145.90/92/94/96	437.025 or 437.050
Mode S (1200 BPSK BBS,FM-SSB)		2401.1 or 2401.1428
AMSAT-OSCAR-17 (DO-17) (Dove)		
Beacon 1 (1200 bps AFSK,Digital Voice,FM)		145.82516
Beacon 2 (1200 bps AFSK,Digital Voice,FM)		145.82438
Beacon 3 (1200 BFSK,Digital Voice,SSB)		2401.2205
AMSAT-OSCAR-18 (WO-18) (Webersat)		
Mode J (1200 BPSK,RC,SSB)	144.30-144.50	437.075 or 437.10
ATV (TV,AM)	1265.000	
AMSAT-OSCAR-19 (LO-19) Callsign = LUSAT		
(1200 PSK,FM-SSB)	145.84/.86/.88/.90	437.15355 or 437.1258
UoSAT-OSCAR-22 (UO-22)		
Broadcast Callsign = UOSAT5-11		

FT-1000MP



YAESU is about to turn the world of HF Transceivers on its head!

Dedicated to the memory of JA1MP, the founder of Yaesu Musen, we are proud to announce the release of Yaesu's latest high performance HF base transceiver, THE NEW FT-1000MP.

Based upon the legendary performance of the FT-1000 which, for more than half a decade, has been highly acclaimed by the world's top DXers, Yaesu has created a new 100W HF masterpiece built upon proven RF design and the introduction of a new technology to the Amateur marketplace: Enhanced Digital Signal Processing (EDSP). Teamed up with Direct Digital frequency synthesis, an outstanding receiver section featuring a high intercept front-end and a wide variety of IF filters (including a Collins Mechanical Filter), the FT-1000MP's exclusive EDSP facilities provide an impressive array of IF-based noise-reduction and interference rejection filters for enhanced receiver performance, as well as flexible tailoring of the transmitter for outstanding signal clarity.

The performance of digital processing systems is highly dependent on the quality of software inside the transceiver, and here Yaesu's experience with software design really shines through. Yaesu's IF-based EDSP provides 4 random-noise filtering protocols, audio enhancement with 4 equalisation programs for Tx and 3 for Rx, and an automatic notch filter which identifies and eliminates multiple interfering carriers or heterodynes. Front panel selectable EDSP filter contours (Low, Mid, or High-Cut responses; or Bandpass) aid in QRM rejection, providing improved signal-to-noise ratios and razor sharp selectivity. A comprehensive menu system allows you to easily hear the effect of various EDSP settings, so you can choose the best selection for your operating conditions.

In keeping with the improvements that the EDSP facilities provide, the FT-1000MP also provides new features such as selectable flat response or optimised receiver front-ends, 3 antenna connectors (2 main antennas and an Rx-only socket), selectable tuning steps as small as 0.625Hz, and a Shuttle-jog tuning knob for fast QSY operation. For optimised transmit audio, different SSB IF offsets can be set for both normal and RF speech-processed transmissions, and can be used in conjunction with the Tx EDSP functions. Separate bar-graph S-meters are provided for each receiver, and even a synchronous detection system is used for better AM reception on the Shortwave bands.

Standard features include SSB/CW/AM/FM operation, an in-built AC power supply and Automatic antenna tuner, 13.5V DC socket, dual-mode noise blankers, 500Hz CW and 6kHz AM IF filters, full break-in CW, an in-built electronic keyer with memory, a multi-colour high resolution display, an RS-232 computer interface, and a MH-31B8 hand microphone.

With the new FT-1000MP now available, why not call us for a copy of Yaesu's 12-page colour booklet explaining more about the FT-1000MP's new level of HF performance and design excellence. We're sure you'll soon agree that the world of HF transceivers has just taken a giant leap forward.
Cat D-3400

$4495

2 Year Warranty

B 2542 Rev

For further information, orders or the location of your nearest store call:
Outside Sydney (local call charge) 1300 366 644
Or Fax: (02) 9805 1986

DICK SMITH ELECTRONICS

BBS Callsign = UOSAT5-12
Mode JD (9600 Baud FSK,FM) 145.90/.975 435.120

KITSAT-OSCAR-23 (KO-23)
Broadcast Callsign = HL01-11
BBS Callsign = HL01-12
Mode JD (9600 Baud FSK,FM) 145.85/.90 435.175

KITSAT-OSCAR-25 (KO-25)
BBS Callsign = HL02-12
Broadcast Callsign = HL02-11
Mode JD (9600 Baud FSK,FM) 145.870 436.500

ITAMSAT-OSCAR-26 (IO-26) Callsign = ITMSAT
Mode JD 1200 baud PSK 145.875 435.867
145.900 435.822

JAS-2 Fuji-OSCAR-29 (FO-29)
Callsign: 8J1JCS
Analog mode Output power: 1 W
Uplink passband: 145.900 – 146.000 MHz
Downlink passband: 435.800 – 435.900 MHz
Digital mode 1200 bps BPSK
Uplink frequencies: 145.850, 145.870, 145.890, 145.910 MHz
Downlink frequency: 435.910 MHz
9600 bps FSK
Uplink frequency: 145.870 MHz
Downlink frequency: 435.910 MHz
Digitalker: FM voice, max 25 seconds
Downlink frequency: 435.910 MHz, output power 1 W
CW tlm: 435.795 MHz, 12 WPM.

Mexico-Oscar-30 (MO-30)
Uplink frequencies: 145.815, 145.835, 145.855, 145.875 MHz
Downlink frequency: 437.306, 437.138 MHz
Modulation types are the same as AO-16, LU-19, WO-18 and IO-26

As always, the list is as accurate as I can determine at the time of writing. Please let me know of any errors or omissions.

*RMB 1627, Milawa VIC 3678
CompuServe: 100352,3065
Internet: 100352.3065@compuserve.com
E-mail: vk3jt@amsat.org*

ar

Awards

*John Kelleher VK3DP - Federal Awards Manager**

Please note that, as from this date, all copy for this column, including DXCC upgrades and applications for awards should be sent directly to my call-book address (as at end of *Awards* column). This does not include fax and e-mail which will be handled as before. This action has been taken to increase efficiency, and to speed up handling of all correspondence relating to awards in general.

In response to several enquiries regarding the JARL Awards program, here are the details of all awards issued by JARL.

JARL Awards

General Rules.

1. JARL awards will be issued to amateur stations and SWLs.

2. Each claim must be accompanied by a QSL card list furnished with the callsigns of stations worked/heard, dates, bands and modes of the contacts meeting the requirements of the award concerned. The form of list will be specified, when required, in the rules of each award.

3. Each list must be accompanied by a statement from the applicant's National society, or from any two amateurs other than the applicant certifying that the QSL cards listed are in the possession of the applicant, and that the items on the cards are correctly listed. If such a statement is not available, the applicant must submit all the QSL cards concerned.

4. A fee of eight IRCs or $US4.00 will be charged per award. An additional two IRCs will be charged for airmail delivery regardless of the number of awards claimed. If QSL cards are submitted, sufficient funds for return postage will also be required.

5. Applicants can request a maximum of three of the following four endorsements :-

(1) Bands: Only contacts within the same band. All amateur bands (3.8 MHz is included in 3.5 MHz).

(2) Modes: Only contacts made within the same mode, CW, AM, SSB, FM, SSTV, RTTY, ATV.

(3) Satellite: Only contacts made through amateur satellites.

(4) QRP: Only contacts made through transmitters with a final input of one watt or less.

6. Only contacts/receptions made on or after 29 July 1952 will be acceptable, except Haca Haga on or after 1.1.1970; for satellite on or after 15.12.1972; for SSTV on or after 10.4.1973; for RTTY on or after 08.8.1968; Okinawa Prefecture on or after 15.5.1972; VU-1000 on or after 29.7.1977; deleted Cities/Guns before the date of deletion mentioned in the JCC/JCG list.

7. Only contacts with land stations (including mobile stations on a river or lake) will be acceptable. Those with maritime and aeronautical stations, however, will be acceptable for the 50 MHz-100; 144 MHz-100; 435 MHz-100; 1200 MHz-10, -50, -100; 2400 MHz-10, -50, -100; 5600 MHz-10, -50, -100 and VU-1000 awards.

8. Only contacts with amateur stations authorised by the administration will be acceptable. Contacts with Far East Military Auxiliary Stations in Japan will not be acceptable.

9. All contacts must be made on land (river/lake) within the same call area or, if no call area exists, within the same country.

10. All correspondence must be sent to: Japan Amateur Radio League, Award Desk, 1-14-2 Sugamo, Toshima, Tokyo 170, Japan.

All Japan Districts (AJD)

May be claimed for having contacted/heard, and received a QSL card from, an amateur station located in each of the 10 call areas of Japan (1-0).

Worked All Japan Prefectures Award (WAJA) Heard (HAJA)

May be claimed for having contacted/heard, and received a QSL card from, an amateur station located in each of the 47 prefectures of Japan. A list of QSL cards/contacts should be arranged in order of WAJA reference number. However, names of prefectures may be omitted.

Japan Century Cities (JCC) SWL-JCC

May be claimed for having contacted/heard, and received a QSL card from, an amateur station located in each of at least 100 different Cities of Japan. JCC-200, -300, -400, -500 and -600 will be issued as separate awards. A list of QSL cards should be arranged in order of JCC reference number. However, names of Cities may be omitted.

Japan Century Guns (JCG) SWL-JCG

Same as the rules for JCC with cities replaced by "guns". But what is a "gun"? Japan has, as administrative districts, 47 prefectures, which are divided into cities, towns, and villages. A "gun", not being an administrative district, is a regional congregation of towns and villages.

In addition, the following awards will be issued. They may be claimed for having contacted/heard and received a QSL card from each of the different stations of the number required, on the frequency band concerned: 50 MHz-100; 144 MHz-100; 435 MHz-100; 1200 MHz-10, -50, -100, -200, -300; 2400 MHz-10, -50, -100, -200, -300; 5600 MHz-10, -50, -100, -200, -300.

VU-1000 SWL-VU-1000

May be claimed for having contacted/heard, and received a QSL card from, each of at least 1000 different amateur stations on the 50 MHz, 144 MHz and/or 435 MHz bands. For contacts exceeding 1000 different stations, VU- 2000, -3000, etc will be issued. A list of QSL cards should be arranged in alphabetical order of prefix, followed by suffix.

Worked All Cities Award (WACA) Heard (HACA)

May be claimed for having contacted/heard, and received a QSL card from, an amateur station located in each of the Cities of Japan that are in existence on the day when the final contact claimed for the award is made. A list of QSL cards should be arranged in order of JCC reference number. However, names of cities may be omitted.

Worked All Guns Award (WAGA) Heard (HAGA)

Same as for WACA, with cities replaced by guns.

Asian DX Award (ADXA) SWL-ADXA

May be claimed for having contacted/heard, and received a QSL card from, an amateur station located in each of at least 30 Asian countries including Japan. DXCC countries are standard, the Asian ones grouped in the Asian Countries List. A list of QSL cards should be arranged in order of the listing of the Asian Countries List.

Asian DX Award Half (ADXA-Half) SWL-ADXA-Half

Same as the above, except that contacts are required from only 15 Asian countries, including Japan.

Heard All Continents (HAC)

May be claimed for having heard, and received a QSL card from, an amateur station located in each of the six continents. The continental boundaries for IARU's WAC are standard, with a few exceptions in Asia which are shown in the Asian Countries List.

Amateur Satellite "Fuji"

Applicants should make contact with 10 different amateur stations through the amateur satellite "Fuji" (only contacts in CW or SSB mode), and should obtain QSL cards from those stations. Amateur Satellite JAS-1 (Fuji, FO-12 8J1JAS) was launched at 2045 UTC on 12 August 1986.

Asian Countries List for ADXA

A4 Oman
A5 Bhutan
A6 U Arab Emirates
A7 Qatar
A9 Bahrain
AP Pakistan
BV Taiwan
BY China
EP Iran
HL Sth Korea
HS Thailand
HZ Saudi Arabia
JA Japan
JD1 Ogasawara Isl
JT Mongolia
JY Jordan
OD Lebanon
S2 Bangladesh
TA2-8 Turkey
UA9/0 Asiatic Russia
UD-4K Azerbaijan
UF-4L Georgia
UG-EK Armenia
UH-EZ Turkmenistan
UI-UK Uzbekistan
UJ-EY Tadzhikistan
UL-UN Kazakhistan
UM-EX Kirghizia
VS6-VR2 Hong Kong
VU India
VU Andaman & Nicobar Isls
VU Laccadive Isls
XU Kampuchia
XW Laos
XX9 Macao
XZ Myanmar
YA Afghanistan
YI Iraq
YK Syria
ZC4 UK bases on Cyprus
1S Spratly Isls
3W/XV Vietnam
4S Sri Lanka
4X Israel
5B Cyprus
7O Yemen
8Q Maldive Isls
9K Kuwait
9M2 West Malaysia
9N Nepal
9V Singapore

Japanese Prefecture/Number List

JA8
- 01 Hokkaido

JA7
- 02 Aomori
- 03 Iwate
- 04 Akita
- 05 Yamagata
- 06 Miyagi
- 07 Fukushima

JA0
- 08 Niigata
- 09 Nagano

JA1
- 10 Tokyo
- 11 Kanagawa
- 12 Chiba
- 13 Saitama
- 14 Ibaraki
- 15 Tochigi
- 16 Gunma
- 17 Yamanashi

JA2
- 18 Shizuoka
- 19 Gifu
- 20 Aichi
- 21 Mie

JA3
- 22 Kyoto
- 23 Shiga
- 24 Nara
- 25 Osaka
- 26 Wakayama
- 27 Hyogo

JA9
- 28 Toyama
- 29 Fukui
- 30 Ishikawa

JA4
- 31 Okayama
- 32 Shimane
- 33 Yamaguchi
- 34 Tottori
- 35 Hiroshima

JA5
- 36 Kagawa
- 37 Tokushima
- 38 Ehime
- 39 Kochi

JA6
- 40 Fukuoka
- 41 Saga
- 42 Nagasaki
- 43 Kumamoto
- 44 Oita
- 45 Miyazaki
- 46 Kagoshima
- 47 Okinawa

4 Brook Crescent, Box Hill South, VIC 3128
Phone (03) 9889 8393

ar

Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar January - March 97

Jan 4-5	ARRL RTTY Roundup	(Dec 96)
Jan 10-12	Japan International DX CW (Low Band)	(Dec 96)
Jan 11-12	VHF/UHF Field Day Contest	(Dec 96)
Jan 19	HA DX CW Contest	(Dec 96)
Jan 24-26	CQ WW 160 m DX Contest	(Dec 96)
Jan 25-26	UBA (Belgium) SSB DX Contest	(Dec 96)
Jan 25-26	REF (France) CW DX Contest	
Feb 1-2	YU DX Contest	
Feb 8	Asia-Pacific CW Sprint	
Feb 8-9	PACC CW/SSB DX Contest	
Feb 8/9	Spanish RTTY Contest	
Feb 15-16	ARRL DX CW Contest	
Feb 21-23	CQ 160 Metre SSB Contest	(Dec 96)
Feb 22-23	RSGB 7 MHz CW Contest	
Feb 22-23	UBA (Belgium) CW DX Contest	(Dec 96)
Feb 22-23	REF (France) SSB DX Contest	
Feb 23	High Speed CW Contest	
Mar 1/2	ARRL DX SSB Contest	
Mar 8/9	Commonwealth Contest (CW)	
Mar 15/16	WIA John Moyle Field Day	
Mar 15/16	Bermuda Contest	
Mar 15/16	BARTG RTTY Contest	
Mar 29/30	CQ WPX SSB Contest	

Work Them Dupes!

Whilst clearing the clutter off my hard disk recently, I came across a piece by Walt AC1O, downloaded from the "cq-contest" reflector several months ago. Although aimed at the IARU Contest, it could apply to any other contest. Here it is, in Walt's own words: *"Until recently, I've been a "clean log" person. Yes, I'd work a dupe even though my computer was beeping insistently at me, but I wouldn't bother putting the QSO in my log the second time. The comments and collective wisdom on this reflector, however, has made me switch to the oft-recommended "log everything" policy.*

"One incident, late in the WPX Contest, drove the wisdom of the "work - and log - them dupes" approach home rather forcibly. The stage was set during the first night of the contest, when the QRM on 40 was just incredible. As a low power entrant, I was S&Ping at the time, and was amazed at how many times TWO stations would come back to my call. Even though I carefully responded with "HA1XYX 599063", more often that not I'd still get a "QSL" from both stations - and usually never did find out who station #2 was.

"Cut to the chase. It's the last half hour of the contest. I'm trying to push the score meter over The Last Hurdle. Multipliers are worth their weight in gold. I find one: the only station in the contest I've heard from this country (and a really good op, too; the call's unimportant). I call. The response: "AC1O QSO B4". Aargh - the guy is absolutely, positively NOT in my log (he was probably one of those first-night doubles). I try desperately to nab the mult, and send "NOT IN MY LOG; PSE DUPE ME". The DX station proceeds to send me the time of our (non-)QSO, the serial number he sent me, and the number I "sent" him. Heck; he could have also told me my mother's maiden name - he was still NOT in my log. A simple re-QSO on his part would have saved all that time and trouble (and I'm not sure I ever did make it into his log that second time...)

"Then I got to wondering: What do the log-checkers do in cases like this? The first QSO was logged by the DX station; in error, to be sure - but I was still in HIS log. The second QSO, though, was the only valid one on both ends. I recalled K3ZO voicing some very real frustration after a recent ARRL contest; he logged the wrong power for his first French QSO, and the log-checkers deleted not just the contact - but the whole French multiplier (even though Fred had worked several dozen French stations on that band!) So, how can the other station manage the situation so that if the first QSO is busted but the second one is valid, he still gets credit for the "AC1" mult?

"This is especially important given the fast-approaching WRTC competition. 52 closely-matched teams are going to be operating in unfamiliar surroundings, where the chance for making mistakes is above normal, the final separation between at least some of the teams may be marginal, and the penalty for logging errors severe. It seems to me a "work - and log - 'em all" approach will be especially important in the IARU contest. It also seems that the judges should make it clear to all concerned - team members and the rest of us alike - what the policy is on duplicates, especially where penalties are involved, so that we can all do our best to minimise their impact. I'd hate to think the difference between one spot and the next in the final WRTC standings was the result of a logging error. I'd feel even worse if the error was partially my fault - and preventable."

Interesting stuff. Unfortunately, this is one of those grey areas where the outcome depends a lot on the thoroughness of log-checking. I must admit to a lot of personal nervousness when CT prints "DUPLICATE" in the log and assigns zero points, for the same reasons as Walt. I've long thought that contest logging programs should print a cross reference between duplicate QSOs with the same station, and am surprised it hasn't been done yet.

In the meantime, one can minimise the chances of having QSOs and/or multipliers struck out by including a "dupe" sheet with the log (an alphabetical list of stations worked), because log-checkers will usually check that sheet for other QSOs with the same country, before deleting the multiplier. For hand written logs, for any stations which are worked more than once, one should add the time or QSO number of all other QSOs with the same station to each such QSO, so that they are all cross-referenced together.

Hopefully, such a feature will eventually become standard in CT and other contest logging programs. In the meantime, we ought to add the extra information to our logs where possible, or else keep our fingers crossed. Fortunately the great majority of log-checkers are pretty reasonable people.

For information this month, many thanks to VK2BQS, VK5OV, AC1O, OE4BKU, PA3BFM, VS6BG, ZL1BVK, *Radio Communications*, *CQ*, and *QST*. Until next month, good contesting!

73s, Peter VK3APN

Asia-Pacific CW Sprint

1230-1430z Saturday, 8 Feb
1230-1430z Saturday, 14 June
1230-1430z Saturday, 18 October

In this series of sprints, the object is for stations in the Asia-Pacific region to work as many stations worldwide as possible within two hours, on 20 and 40 m CW. Output power is limited to 150 W. Exchange RST + serial number, and count

one point per valid QSO. *The called station (usually the CQer) must QSY at least 1 kHz after a QSO.* The multiplier is the total number of prefixes, per WPX rules (ie each prefix once only, not once per band). Final score equals valid QSOs x multiplier. Post your log to: James Brooks, 15 Balmoral Road #03-08, Singapore 259801, Singapore, postmarked within seven days, or e-mail to *9v1yc@equator.lugs.org.sg* within 72 hours.

PACC CW/SSB DX Contest

1200z Sat to 1200z Sun, 8/9 Feb

This is a very popular European contest, with phone and CW held on the same weekend. The object is to work as many Dutch stations as possible on 160 to 10 m, excluding the WARC bands. Categories are single and multi-operator; SWL. Only CW contacts are eligible on 160 m. Stations may be worked only once per band, regardless of mode.

Exchange RS(T) plus serial number; Dutch stations will RS(T) plus a two letter province code. Possible codes are: DR, FR, GD, GR, LB, NB, NH, OV, UT, FL, ZH, and ZL. Score one point per Dutch QSO. Contacts must be confirmed by TU, OK or QSL. Final score equals the total QSO points times the total Dutch provinces worked from each band (max 72). Mail logs with summary sheet and declaration by 31 March to: Frank E van Dijk PA3BFM, Middellaan 24, NL-3721 PH Bilthoven, The Netherlands. Certificates will be awarded to the top scoring stations in each category and country, including second and third places where justified.

Spanish RTTY Contest

1600z Sat to 1600z Sun, 8/9 Feb

The object is to contact as many stations worldwide as possible, on RTTY, 80 to 10 m. Categories are single operator (single/multiband); multioperator single transmitter; SWL.

Exchange signal report and CQ zone. Spanish stations will send signal report and province. On 10/20 m score one point per QSO with stations inside your WAC continent, and two points with stations outside your WAC continent. On 40 and 80 m, the QSO points are tripled. QSOs between stations in the same country can be claimed for multiplier credit, but not QSO points. The multiplier is the sum of the DXCC countries and Spanish provinces (max 52) per band. The final score is the total QSO points times the multiplier.

Send log, summary and declaration within 30 days to: EA RTTY Contest, c/o EA1MV Antonio Alcolado, PO Box 240, 09400 Aranda de Duero (Burgos), Spain.

ARRL DX Contest

CW: 0000z Sat to 2400z Sun, 15/16 Feb
SSB: 0000z Sat to 2400z Sun, 1/2 Mar

There is always plenty of activity in this popular contest. The CW section runs on the third full weekend in February each year, and the phone section on the first full weekend in March. The object is to work as many W/VE amateurs as possible on 1.8-30 MHz. Categories are single operator (single band, all band, all band QRP max 5 W O/P, and all band assisted); Multioperator (single Tx, two Txs, and unlimited). In the single and two Tx categories, once a transmitter has begun operation on a band it must remain on that band for at least 10 minutes. Listening time counts as operating time.

Exchange RS(T) and a three digit number indicating approx output power. W/VE stations will send RS(T) and state/province. Score three points per W/VE QSO. The multiplier is the sum of US states and District of Columbia (DC) (except KH6/KL7), NB (VE1), NS (VE1), PEI (VE1 or VY2), PQ (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NWT (VE8), YUK (VY1), NF (VO1), and LAB (VO2) worked to a maximum of 63 per band. The final score equals the total QSO points times the multiplier.

Entries with more than 500 QSOs must include crosscheck (dupe) sheets. Logs on DOS disk are welcome in lieu of a paper log, providing a paper summary sheet showing usual info is included. Multioperator entries must list all operators. Entries must be postmarked within 30 days after the last contest or they will be classed as checklogs (no exceptions)! Mark the envelope CW or Phone, and send the log to: ARRL Contest Branch, 225 Main Street, Newington, CT 06111, USA. Certificates will be awarded to the top scoring stations in each country and category, and plaques to the top worldwide and continental stations.

RSGB 7 MHz CW Contest

1500z Sat to 0900z Sun, 22/23 Feb

The object of this contest is to contact as many British Isles stations as possible on 40 m CW. Exchange RST plus serial number starting at 001; UK stations will add their county code. Oceania stations score 30 points per QSO, and the final score is the total QSO points times the number of UK counties worked. Include a summary sheet showing all standard details, plus a checklist if more than 80 QSOs are made. Send logs to arrive by 14 April to: RSGB HF Contests Committee, c/o S V Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey, CR7 7AF, England. Airmail is recommended, as late logs may be treated as check logs. Certificates will be awarded to the leading entrants in each overseas section.

REF (France) SSB DX Contest

0600z Sat to 1800z Sun, 22/23 Feb

This contest takes place on the last full weekend of February each year. The object is to work as many stations in France and French overseas territories (F, T, DA), as possible on 80-10 m SSB. Categories are single operator; single and multiband; and multioperator. Exchange RS(T) plus serial number, F stations will add their Departement. Score one point per QSO with eligible stations in the same continent, and three with stations in a different continent. Multipliers are Departements, FFA and DOM-TOM. F6REF/00 counts as an additional multiplier. The final score equals total QSO points x total multiplier. Send log to arrive within six weeks to: REF Contest, PB 2129, F-37021 Tours Cedex, France.

High Speed CW Contest

0900-1100z and 1500-1700z, Sunday, 23 Feb

This interesting contest is organised by the High Speed CW Club, and runs on the last Sunday in February. Bands are 80-10 m, and categories are HSC Members, non-members, QRP, and SWL. Exchange RST + HSC number or serial number. Score one point per QSO with own continent, and three points for DX. Each DXCC country per band counts as a multiplier.

Final score equals points times multiplier. Maximum output power is 150 W, and stations can be worked once per band and period. Send logs within six weeks to: Frank Steinke DL8WAA, Trachenbergerstra·e 49, D-01129 Dresden, Germany.

Results of 1996 Australasian Sprints

Presented by David VK5OV

Entries for the 11th Australasian Sprints totalled 12 CW, including two Novice class operators, and 23 phone, including an SWL. These represented about 20% of the callsigns recorded. My thanks to those who sent their logs, and especially to that most welcome group of regular entrants.

The Adelaide Hills Amateur Radio Society and the SA/NT Division of the WIA congratulate the overall winners, VK1WI representing the ACT Division of the WIA (operated by Jim Miller VK1FF), and Barry Chammen VK5KCX, who was successful at last in the phone section after a couple of very near misses. Congratulations also to Joe Burford VK5NOT in the CW section, and the leading scorers in the individual call areas.

The results are shown below. Certificate winners are denoted by asterisks:

CW:

VK1WI **	33
VK2AIC *	15
VK3DXI *	24
VK3APN	19
VK3NCY	8
VK4OD *	10
VK5AFO *	22
VK5NOT *	19
VK5PO	17
VK5XE	15
VK6AF *	15
VK8AV *	24

Phone:

VK1WI *	51
VK1FF	27
VK1PK	20
VK3IO *	41
VK3DXI *	41
VK3MSL	15
VK3OZ	12
VK4LAA *	3
VK5KCX **	67
VK5PO	59
VK5DL	41
VK5NOS	35
VK5YX	31
VK5TY	23
VK5KGS	21
VK5GMH	19
VK5PEB	15
VK6BIK *	14
VK8AV *	42
ZL1BVK *	35
ZL1AFQ	21
ZL3GL *	18
I. McGovern *	44

Results of Waitakere Sprint

(Certificate = *)

Phone:

VK4PCB *	52
VK4CRO *	44
VK2XT *	39
VK5NFJ	30
VK5OV	11

CW:

VK5NFJ *	8

Results of 1996 PACC Contest

(Callsign/QSOs/Mult/Final Score)

VK2APK*	42	17	714
VK4XA	22	12	264
VK4TT	14	8	112
VK3APN	6	4	24

Results of 1996 ANARTS RTTY Contest

Presented by Jim, VK2BQS

World Plaque Winners:

Single Operator	UT0I	4,198,658 pts
Multioperator	RK9CWA	5,389,360 pts
SWL	ONL383	271,065 pts

Single Operator:

(Callsign/Final Score/QSOs/Mult/Continents/VK Bonus)

= World Plaque, * = Continental Winner

UT0I #	4,198,658	448	117	6	1400
UR7E	3,346,276	354	116	6	1300
VK2KM *	3,319,422	194	79	6	n/a
AB5KD *	3,286,828	541	119	6	1000
UN5PR *	2,622,592	265	106	6	1000
N1RCT	2,079,062	381	89	6	200
UA4LL	1,874,058	282	97	6	600
WA6VZI/7	1,841,545	264	77	6	1400
N6GG	1,569,720	215	74	6	2400
G4BWP	1,289,940	201	78	6	600
SM3KOR	1,041,312	217	63	6	300
I2HWI	982,750	170	75	6	400
ZL2JON	941,724	121	57	4	5100
OI3LQK	834,740	236	66	5	500
RA0FU	832,332	141	67	6	1800
OK2SG	822,012	145	76	6	300
US9QA	815,450	212	75	6	500
OH2LU	765,672	166	66	6	600
DL7VOG	664,300	141	54	6	100
WD0CHW	617,744	175	54	6	200
CE8SFG *	611,000	90	40	5	-
IK0HBN	571,325	148	65	5	300
G5LP	510,550	141	83	6	100
VK5AI	454,935	74	39	5	n/a
KI4MI	454,340	143	62	5	500
AH6JF	449,320	134	43	4	400
KA2CYN	416,725	118	55	5	100
VE6KRR	400,496	96	44	6	800
4X6UO	391,155	120	43	5	700
OK2BXW	357,310	102	41	5	200
KD6TO	323,590	124	34	5	1100
SP9LKS	285,892	96	52	6	100
JH1HRJ	270,672	63	33	6	600
VK2CTD	250,880	64	32	4	n/a
JA1SJV	247,220	65	36	5	1700
WA4JQS	220,030	85	34	5	900
ER5AA	215,975	91	53	5	-
K7WUW	211,360	79	36	5	400
K6HGF	197,348	111	34	4	1100
WA0ACI	163,280	102	41	5	100
JA9DDF/2	162,952	45	26	6	400
KE7GH	145,700	85	33	4	500
W9FFQ	140,015	89	41	5	-
VK3DXI	123,215	38	19	5	n/a
YL2KF	119,038	68	43	6	100
SP3RBT	112,140	59	35	6	-
JH3WKE	102,200	42	25	4	500
VE8NC	101,136	51	29	4	100
OM3PR	94,185	60	39	5	-
VK2DPM	93,900	37	15	5	n/a
SP3FAR	86,284	40	27	6	100
VE6FR	84,475	42	25	5	600
VK2BQS	71,536	36	17	4	n/a
KD2YG	63,564	45	24	4	300
N2LEB	60,900	46	29	4	-
SM3LGO	53,028	44	27	4	-
AA9RR	52,904	58	34	4	-
HB9DBK	50,746	27	23	6	100
W2JGR/0	43,500	39	20	5	100
SM6APB	34,560	26	18	5	-
SM4RGD	32,373	55	33	3	-
SP2EIW	31,220	70	35	2	-
LA7AJ	24,048	27	18	4	-
SP2FN	18,600	29	20	5	-
DJ2YE	13,430	27	17	5	-
KB9KWL	12,672	37	16	3	-
VK2AIC	11,040	17	10	2	n/a
VK3EBP	6,146	12	7	2	n/a
DF5BX	3,744	15	13	3	-
SP2UUU	992	15	8	2	-

Check Log F/OH2LU

Multioperator:

RK9CWA #	5,389,360	431	140	6	1,600
AA5AU	* 3,965,922	426	123	6	3,600
IK2BUF *	2,816,144	315	114	6	800
OH0JWH	2,558,460	380	110	6	300
VK6GOM *	2,082,785	181	71	5	n/a
VE3FJB	397,200	108	45	6	300
VE3UR	133,012	110	36	4	-

SWL:

ONL383 #	271,065	96	51	5	-
ONL3997	11,424	30	17	3	-

Note: A detailed report has been sent to all entrants.

*PO Box 2175, Caulfield Junction, VIC 3175
pmeshit@melbpc.org.au

ar

Divisional Notes

Forward Bias – VK1 Notes

Peter Parker VK1PK

Technical Symposium Draws Many

Amateur radio direction finding, packet gateways and microwave techniques. These were just some of the attractions at November's VK1 Technical Symposium. Organised by Mike VK1KCK, the Canberra Amateur Packet Radio Group and several other helpers, attendance was well up on last year with 48 amateurs present. Other presentations included getting the most out of your packet radio TNC, HF receiver design and complex numbers. As well, there were talks on TCP/IP, HF digital operation, local area networks, future modulation techniques and DX clusters. An amateur positioning system was demonstrated, and attendees could test their equipment on an RF test station. John Day from Daycom Communications Pty Ltd was also there, with a well-stocked table of books and station accessories. It might be of interest to note that of the fourteen equipment suppliers written to, just two replied, and of those only one could attend.

Man Convicted of Ginini Theft

The adult involved in last year's theft of repeater equipment from Mount Ginini has been found guilty. Appearing in the Canberra Magistrates' Court on Tuesday, Mr Gary Cooper was convicted of aiding and abetting the theft of equipment from Mount Ginini. The equipment stolen included the UHF Channel 7 CB repeater operated by Outward Bound, and the two metre voice and packet radio repeaters, owned by this Division.

Gilbert Hughes VK1GH, who was at the trial, advises that Mr Cooper had initially pleaded not guilty. However, at Tuesday's trial he changed his mind, pleading guilty to two of the three charges laid. Mr Cooper was not acting alone. One juvenile was convicted in the Children's Court last year in relation to the theft.

Because of the crime's severity, the case has been referred to the Supreme Court for sentencing in early 1997. The matter of compensation will be considered at this time.

Canberra Rally

As has become the custom in Canberra, amateurs provided communication for the annual Rally of Canberra held in mid-November. Despite early difficulties in attracting volunteers, it came good in the end with some 50 local and interstate amateurs taking part.

Raffle Drawn

The raffle for the Chirnside Yagi was drawn at the November General meeting. Congratulations to Eric VK1EP who had the lucky ticket.

Sprint Success

VK1WI topped the country in last July's Australasian CW Sprint. November's Committee meeting heard that Jim VK1FF, who operated as VK1WI, made 33 contacts in the hour-long 80 metre CW contest. For its efforts, the Division received a handsome plaque from the Adelaide Hills Amateur Radio Society, and the WIA VK5 Division, the joint sponsors of the annual sprint.

AGM Next Month

This year's Annual General Meeting of the WIA (ACT Division) will take place at 8 pm on Monday, 24 February at the Griffin Centre, Civic. It is understood that several committee members will not be re-nominating. If you have thought about becoming involved in the running of the Division, 1997 could be the year for you.

VK1KCM BBS Returns

The VK1KCM BBS system is now back on the air. Carl VK1KCM reports that, while it shouldn't seem much different to users, there have been MAJOR changes in the system, not just the location change.

The BBS is now located in Kambah, on the foothills of Mt Taylor. The 147.575 MHz 1200 baud port has a 3 dBd gain vertical at 20 feet. The 144.800 MHz 4800 baud port has a 5/8th wave on the gutter. Radios are the same as they were before.

The BBS is now running on a 386SX at 33 MHz with 8 Mb RAM and 40 Mb of hard disk. The radio ports are now connected to a 386DX40 running Linux 2.0.24 and Kernel AX.25. It is planned for other services to start appearing on the Linux box and the gateway machine (a 486DX33 running FreeBSD).

There is a serial link between the BBS machine and the Linux box ('cause the ethernet link is having problems). An rxecho daemon running on the Linux box echos packets between the radios and the BBS so it can be accessed directly by users on both frequencies.

To connect to the VK1KCM BBS connect to VK1KCM-0. The node may or may not be available on VK1KCM-1.

VK2 Notes

Peter Kloppenburg VK2CPK

The bonds between affiliated clubs and the NSW Division of the WIA were re-established and strengthened during the Conference of Clubs that was held on 9 and 10 November 1996.

Of the 41 clubs affiliated with the NSW Division of the WIA, 17 were represented at the conference. Most clubs had sent two club members and total attendance ranged from 50 to 70 people, including guests and visitors. The Divisional Council was represented in full, with most councillors making presentations about their respective portfolios and other associated activities.

As it had been a while since the last conference, Council had decided to start from scratch and make presentations about what it does and how it does it. The agenda for the conference covered a two-day event, comprising presentations, discussions, and speeches by invited guests. Westminster rules of debate were adhered to, just like any normal Council meeting. Meals were provided free, and there was plenty of opportunity for informal discussions between Councillors and attendees.

The Spectrum Management Agency (SMA) was represented by Mr Vlies, acting manager of the North Sydney branch. After talking about his background in radio communications, he spoke at length about the SMA and the changes that the rapidly increasing demand for radio spectrum places upon it. He also pointed out that the radio spectrum is a national resource owned by the

community, a resource that has to be controlled and maintained just like a park or a waterway. Hence, the principle of the user pays!

Another guest speaker was Ms M Friend, representing Select Insurance Brokers. As most of you know, affiliation with the WIA entitles the club to group insurance for public liability. This means that the premium for such insurance is much lower than would normally be the case. Ms Friend spoke in particular about how this insurance covers volunteer workers of clubs. She quoted examples of when the cover applies and when it does not. Any club member who has queries on this subject should contact the WIA office in Parramatta.

The subject of Policy and Strategy was introduced by Mr Jensen, Vice-President of WIA NSW. His committee is working on a policy and strategy for the NSW Division that will take it into the next century. Mr Jensen spoke about the urgent need to plan for a rapidly changing perspective of amateur radio, such as in the growing usage of packet radio, satellite operations, digital communications, and competing interests such as Internet with voice options. He said that the Institute will do more to publicise its image with the younger generation through talks and demonstrations of amateur radio at schools and colleges. His committee had formulated a plan of action for the WIA to follow, and he distributed copies of it to those present at the conference. He urged everyone to discuss its contents and comment on it as soon as possible.

Our New South Wales Technical Advisory Committee (NTAC) was represented by Mr G McGrorey-Clark. Geoffrey gave details of how his committee works and how it deals with submissions from clubs for new frequency allocations for repeaters and links. He stressed the importance of correctly filling in forms and providing all the data asked for in the forms.

On Sunday it was Mr P Naish, Federal Secretary of the WIA, to take the opportunity to speak about his portfolio. Peter gave background information about the administrative operations that he is involved with at the Federal Secretariat. He also provided an insight into the structure of the secretariat, who owns it, who contributes to it, and who are its members. Furthermore, he identified members of the Federal Executive and explained what their purpose is.

Following Peter, was Mr K Westerman, Chairman, Conference of Clubs. Ken had been very busy lately, organising the conference, writing all the letters and making all the telephone calls. Ken made a short speech about the purpose of the conference and how it could benefit the clubs. He invited the representatives to consider how to build on the success of this conference with suggestions about the structure and purpose of the next one in May 1997.

Many subjects were discussed and spoken about in these two days and from the feedback we can conclude that the conference was a success and enjoyed by all who attended. Council hopes that next year more clubs send representatives to the Conference of Clubs, an opportunity too good to miss.

VK2 Web Page Moves

The VK2 Divisional Web page has been relocated to another site, following a change in Web traffic pricing policy at our current Internet Service Provider. In early December the Division received a generous offer to host the VK2 Web page from Dr Tony Farrow VK2TJF at Macquarie University's Department of Mathematics, Physics, Computing and Electronics.

The Web page, which has received about 2500 visits since we started counting them in June, has proved very popular with Internet "Web surfers", including amateurs from all over the world. The resulting ten megabytes of traffic generated each week by these visits became a liability when our service provider decided to charge us by the kilobyte!

The new URL for the Web page is *http://marconi.mpce.mq.edu.au/wia*

The existing Divisional e-mail address, *wiansw@sydney.dialix.oz.au* remains unchanged for the time being, and the old Web page URL will redirect browsers to the new Web page for a while, to give everyone a chance to update their Web browsers.

Many thanks to Tony, and Craig Pattison VK2BTQ, who did the necessary work at Macquarie University to establish the new Web page, and of course to the University's Department of Mathematics, Physics, Computing and Electronics for hosting the Web site for the Division.

Flash! The callbook for 1997 is available now! Members $13, plus P&P $2.30.

VK3 Notes

Barry Wilton VK3XV

Repeater Licences

WIA Victoria is actively involved in the national debate concerning the future cost of repeater licences and has fully examined the effect the increased charges imposed by the SMA will have on the Victorian repeater network.

We are hopeful that through proper negotiation at the appropriate level, the SMA may reconsider its decision to charge for repeater licences on an "assigned frequency" basis.

There are several aspects which deserve consideration, and further discussion will include legal implications, regulation, and cost effectiveness to the SMA.

Regardless of the final outcome of any negotiations, the overall cost of repeater licensing will more than double from the current figure, and a reduction in the number of repeaters supported financially by WIA Victoria appears to be inevitable in the near future.

WIA Victoria will endeavour to maintain a backbone of repeaters throughout the state; and others will be offered to interested clubs and groups on a local basis, and WICEN will possibly take control of others for emergency use only.

Membership Subscriptions

Many members will have received their membership renewal notices for 1997 and noted the change to a common renewal date of 1 July.

This change was made as the result of a decision by the Federal Council in an attempt to reduce operational costs of the Federal Secretariat.

The WIA Victoria Council appreciates the need for a major reduction in expenditure at Federal level, and is committed to securing better management of the funds WIA Victoria members contribute.

The Council is concerned, however, that the implementation of this change by the Federal Secretariat may cause undue confusion and inconvenience to members, and in that instance the Council may take alternative action in relation to the collection of subscription renewals in the future.

Disposals Equipment

WIA Victoria has been actively seeking and tendering for good equipment to be made available to members at bargain basement prices. We currently have a number of Philips FM92 UHF Transceivers which are fully synthesised (99 channel) and are easily converted to the 70 cm band. Low band VHF Philips 828s are also available for only $10.00.

VK6 Notes

John R Morgan VK6NT

Divisional News

The President and Council send their best wishes to all VK6 radio amateurs and listeners, for a happy and DX-full new year.

In the business section of the November GM, mention was made of the VK3 Division's concerns about the conduct of Federal WIA affairs. Will VK6UU then commented on the recently introduced scale of fees for beacons and repeaters. Despite the removal of the "$91 SMA study component", the rise to $50 per frequency could result in inability to pay for some services, as the total licence fee bill for

WARG, for example, would rise to about 50% of its present annual income. The President of the Federal WIA, Neil VK6NE, outlined the approach being taken by the Federal WIA towards an endeavour to have the SMA reconsider the heavy new impost on these community services.

Following the business part of the meeting, Wal VK6KZ led a discussion entitled "The Future of the WIA". Only time will tell whether anything will come of this exercise, but the process has started in a most workmanlike manner, and promises tangible improvements in the management of our hobby, at least in VK6. Recordings of parts of the discussion were included in recent Divisional broadcasts.

General Meetings are held on the third Tuesday of each month in the Board Room, 3rd Floor, CWA House, 1174 Hay Street, West Perth, commencing at 8 pm. Usually, there is no meeting in December. All interested persons (members and non-members, licensed or listener) are invited to attend, and will be plied with free coffee and biscuits.

WA Repeater Group

WARG's chairman, Ralph VK6KRB, reports that the re-location of the peripatetic 2 m repeater VK6RPD (146.950 MHz) is progressing well, and may be complete before these VK6 Notes are published. The new site is in Attadale, at the elevated QTH of Don VK6UT (whose son Mike VK6JMT is a well-known repeater-builder). Note that, as part of the re-location, the machine's callsign is to be changed to VK6RFM, to reflect its primary task of reaching the parts of Fremantle which other repeaters cannot reach!

If You Have Material ...

Material for inclusion in this column may be sent to VK6NT @ VK6ZSE.#PER.#WA.AUS.OC, or to PO Box 48, Beverley WA 6304, or via telephone on (09) 291-8275.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

This month is rather quiet with very little activity on the Divisional front. No regular monthly meetings of the Branches have been scheduled. However, I believe that the Domain Activity Centre will still be open on Wednesday afternoons from 12 noon to 4 pm. The Northern Branch are holding an informal get-together with members on the east coast on Sunday, 11 January from 11 am. The venue will be the QTH of Paul Godden VK7KPG in Scamander. I am certain there will be a talk-in on either the 146.900 or 146.725 MHz repeaters if you are looking for directions.

All three branches will be holding their Annual General Meetings next month and, in accordance with their Rules, nominations for Branch positions should be handed in 21 days prior to the scheduled date for the AGM with any notices of motion to be in 28 days prior to the Meetings. The dates are: Southern Branch, 5 February 1997 at 2000 hours at the Domain Activity Centre; Northwestern Branch, 11 February 1997 at 1945 hours at the Penguin High School; and Northern Branch, 12 February 1997 at 1930 hours at the Launceston Institute of TAFE, Alanvale Road, Newnham, Block "C".

Also, the Divisional Annual General Meeting will be held on 22 March 1997 at the registered office of the Division, the Domain Activity Centre, Hobart. It will commence at 1400 hours. Nominations for Divisional Council should be in the hands of the returning officer 21 days prior to the AGM and those proposing and seconding the nomination must be current financial members. The address where these should be sent is in the WIA Divisions directory on page 56 of this magazine. Notices of motion also must be lodged 28 days prior to the meeting to the secretary at the same address.

ar

How's DX

*Stephen Pall VK2PS**

For some people the reason of moving from the old year into the new year is hope! Hope that the new year will bring "more" of everything. Better luck, more money, better health, more happiness, and all sorts of things which humans wish to each other and to themselves.

We radio amateurs, especially those who favour the HF bands and are looking for contacts in far away places, wish and hope for improved propagation on the bands. Propagation at the present is in the doldrums, in between two cycles, and every day brings its surprises and disappointments.

Since early November the 10 cm flux, which is one of the indicators of the sun's activity, has started to climb above the usual index of 69. Index numbers were increasing from 70 to 72 to 74 to 75 to 83 to 91 to 100 and, on 27 November, even reached 104. Jubilant voices were heard on many bands: "here is the beginning of the new Cycle 23!"

Is this so? Not quite, according to Dr Richard Thompson a solar scientist with the IPS Service. I consulted him again to seek an explanation for the sudden rise of the flux numbers. He said: *"The sunspot regions that we presently see on the sun all still belong to the old cycle, except one, which is part of the new cycle. I think that the sudden rise of the flux is a one-off situation, but it is significant that a couple of the old cycle sunspots have grown reasonably large which could indicate some improvement in propagation."* So let's hope for better propagation in 1997.

The Heard Island DXpedition, which will start in a few days, will put this "hope of better propagation" to a severe test. Will the DXpedition reach the magical 100,000 QSOs in two weeks operation? Only the future will tell.

Until then have a happy, prosperous and healthy New Year!

Heard Island VK0IR

This is the month, the first one in the new year, for which many thousands of DXers all around the world have waited for many years. The third most wanted DXCC country, according to the 1995 survey, will come on air after 14 years of silence. Many older DXers still remember the exciting weeks of 1983.

The team of DXers, specially chosen for their communication and other skills, assembled shortly after Christmas on Reunion Island. From there they sailed towards their destination in the French Antarctic ship "Marion Dufresne" bound for Crozet, Heard and Kerguelen islands. They will depart Reunion on 3 January and are expected to be on Crozet on 8-9 January, and arrive on Heard Island on 12 January. They will depart Heard Island on 28 January, arrive on Kerguelen on 30 January and back to Reunion on 5 February.

The latest list of the team (there were a few changes) includes EA8AFJ Michel Sabatino, HB9AHL Willy Rusch, HB9AFI Curt Wetter, K0IR Ralph Fedor, K4UEE Bob Allphin, K9AJ Mike McGirr, KK6EK Bob Schmieder, N6EK Bob Fabry, N6MZ Michael Mraz, OE9AMJ Arno Metzler, ON6TT Peter Casier, PA3DUU Arie Nugteren, RA3AUU Igor (Harry) Booklan, VK2JDM (former VK2TQM) David Muller, W8FMG Wes Lamboley, W0GJ (WA0PUJ) Glenn Johnson, WA3YVN Al Hernandez, 9V1YC James Brooks and NP4IW Carlos Nascimento.

Callsigns

The expedition will use the following callsigns. Reunion Island, TO0R; during the sea voyage, FO0R/mm; on Crozet, TX0K; on Kerguelen, TX0C; and on Heard Island, VK0IR. From the first day of landing, while setting up camp and before the activity starts, the NCDXF beacon will run from the island as VK0IR with an R5 vertical. It will transmit on 14.100, 18.110, 21.150, 24.930 and 28.200 kHz. It will transmit for ten seconds on each band every three minutes. The VK0IR transmission on twenty metres is at one minute and ten seconds after the hour and every three minutes after that. The transmissions on the other bands follow every ten seconds with the ten metre transmission starting at one minute and fifty seconds after the hour and every three minutes after that. On each frequency it sends VK0IR in CW at 100 W in a decreasing power system.

Through the whole operation on Heard Island, from just before sunset to just after sunrise, when the band is not used, a special 160 metre beacon will run on 1.826.5 kHz with full legal power on a monoband top-loaded vertical.

Talking about the sunset and sunrise times on the island, this data is useful for the DXer (all times in UTC): 7 January, sunrise 2257, sunset 1532; 13 January, sr 2308, ss 1521; 21 January, sr 2314, ss 1520; 27 January, sr 2333, ss 1504.

Pilots

During the whole of January selected radio amateur stations, called "pilots", will stand-by on all the bands and will monitor and provide feedback, comments or ionospheric predictions and other useful information to those on the island. This contact with the island will be made via e-mail, packet BBS to the PACSAT satellite with a gateway in Europe. In the same way local news will be sent from the island to the pilots for general distribution and information either via PACSAT or via Internet and/or the Inmarsat telephone service. The callsigns of the pilots and their area of feedback are Isao JH1ROJ (Japan); Randy K0EU (US Midwest, Central); Don N1DG (US Eastcoast); John ON4UN (Europe and pilot coordinator); Bob W0EK (US Midwest, North); Jay W2IJ (US Westcoast and Oceania); and Scotty W4WW (US Midwest, South).

Operating Frequencies

The following operating frequencies will be used: CW – 28.024, 24.089, 21.024, 18.074, 14.024, 10.104, 7.007, 7.022, 3.507, 3.522, and 1.826.5 MHz: SSB – 28.475, 24.945, 21.295, 18.145, 14.195, 7.065 (EU), 7.065 (non EU), 3.799 (EU-JA-VK; receiving down in SSB for VK on 3798), and 3.799 MHz (US, receiving down in SSB); RTTY – 21.085, 18.105 (if 17 m proves to be the best band to one continent), 14.085, 10.140 (if this is the best band for one continent), or 7.030 (if this is the best band).

The expedition will use split frequencies, maximum 25 kHz on SSB and maximum 15 kHz on CW. They will not work anybody outside the split window. Please listen for instructions. The expedition will use directed calls to "continents". There are three continents in their books, Asia/Pacific, Europe/Africa/Middle East, and the Americas. I have approached the Czar of Radio Operations (the title is their designation, not mine!), Peter ON6TT, to have a new call area established "for VK/ZL only". Whilst Peter is fully aware of our problem concerning the powerful JA and USA stations he decided to stick to the already specified "continents".

However, in a fax dated 21 October he said: *"We will need to take care that one part of the area is not completely covering the other. YB, DU, BY and VK/ZL will need to be treated separately from JA. I will edit the manual and stress this explicitly and will take VK/ZL as a typical example."* Accordingly, the manual was altered on 22 October.

Another matter has also arisen about the listening frequency in the 75 m "DX Window". Originally the listening frequency for the VKs was on 3795, right next to the prohibited frequency of 3794 plus 1 kHz. Being aware of the lower sideband problem on SSB with the legal power of 400 watts, I suggested to Peter ON6TT to move the listening frequency nearer to the transmitting frequency. This was agreed on 27 November and VK0IR will now listen for VKs only on 3798. Please be extremely vigilant and attentive for instructions when operating in the DX Window. Incidentally, the Heard Island DXpedition is well aware that the maximum legal power on any Australian Territory is 400 W PEP on SSB. I do not think

that it is necessary to mention it, but I assume that it will be common courtesy to give priority to VK0IR when they are working in the DX Window.

Australian Participation

The only VK participant in the Heard Island DXpedition is David Muller ex VK2TQM. David is a valuable member of the expedition on the technical side. However, despite his busy professional schedule, he managed to pass the basic Morse examination held recently and he is now the proud owner of the combined call of VK2JDM which will give him limited access to the 80, 15 and 10 metre bands

The expedition still needs quite a few dollars to complete its budget. David did an excellent job in inducing people to donate money towards the expedition's costs. The VK2 Division made a donation of $150 for the project; a few amateur radio clubs in NSW and other organisations have also donated a variety of sums or useful commercial goods. But there is still need for more donations, however small. Here is an idea which will give you not only a permanent memento of this expedition, and every true DXer should obtain one, but the profits from this VK-originated idea will boost the expedition funds.

Private Commemorative envelope covers will be produced in Australia with two different Heard Island logos and Antarctic stamps. Each standard cover will be autographed by one of the expedition members. Special limited release covers will be autographed by all members of the DXpedition. These covers cost from $7.00 (autographed by one expeditioner) to $35.00 (cover autographed by all the expeditioners). Postage and handling charge is an additional $3.00. All the orders and payments will be handled by David Muller after he returns from Heard Island. Send your order, payment and/or donation to: Heard Island Expedition, Locked Bag 29, PO Rydalmere, NSW, 2116, Australia. In the meantime I have a number of blank order forms with all the details and prices. If you wish to receive such an order form, send a self-addressed and stamped business size envelope to my address at the foot of this column.

Finally, one more important piece of information. The QSL Manager for the DXpedition is W4FRU John H Parrott Jr, PO Box 5127, Suffolk, Virginia, 23435 USA. Send your card with a self-addressed, return envelope and return postage.

Many of us need Heard Island as a new DXCC country. Please be reasonable, patient and tolerant towards your fellow amateurs in the big pile-up. Listen and follow the instructions of the operators. If they call for North America, they will not answer your call, because you are in the Oceania region.

I wish them good luck and good weather conditions. My wish to the readers of this column is that I hope you will be able to work them.

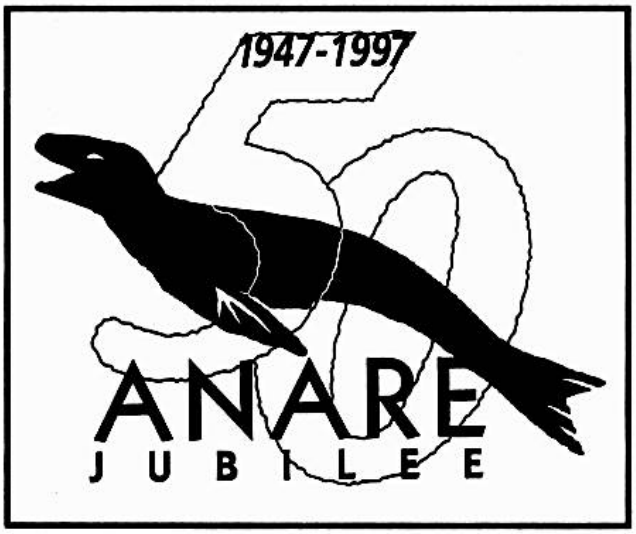
Macquarie Island
VK0TS VK0WG
VK0KBB

Warren VK0WH, having completed his tour of duty, left Macquarie Island mid November. Many DXers, for whom he was the first contact with Macquarie Island, and the DX community at large, thank him for his cooperation, assistance and understanding of the "need" of his activity.

The summer months, from late October to the end of March, are busy times on Macquarie, as they are on all Antarctic ANARE (Australian National Antarctic Research Expeditions) bases, Casey, Mawson and Davis. The long-term "wintering" crews are replaced with new personnel plus a number of small scientific groups who are at various bases only for the "summer" season for 3-4 months. This is the time when the bases are a hive of activity and accommodation space is stretched to the limit. This is also the time when amateur radio takes a "backseat" in the scheme of things. However, 1997 appears bright for amateur radio on Macquarie Island.

I am happy to confirm that in 1997 we will have three amateur radio operators on the island. Tom VK0TS is Communications Technical officer, Eric VK0KBB is in the engineering section and Graham VK0WG is attached to the meteorology unit at the base. All three have been employed by the ANARE since July 1996 and in the past few months were undergoing intensive practical training in Hobart for the task ahead. This included field training, fire fighting, rough surf board training and many other specialist courses. They arrived on the island on the Aurora Australis Voyage 3 in early December 1996. There is not much time for ham activity as the changeover and resupply of bases means long working hours and little spare time.

Tom VK0TS is from Canberra and was working as a satellite laser ranging electronics technician and operator in Orroral Valley. He is 25 years old, commenced employment as Communication Technical Officer with the Antarctic Division in July 1996 and had been training in Sydney and Hobart. The communication network at Macquarie is complex. The main link to the rest of the world is the ANARESAT satellite link with Inmarsat and HF as a backup. He will be maintaining this equipment with the Chief Communication Technical Officer. Tom plans to be active on HF on both CW and SSB. He will be concentrating on the 80 and 40 m bands to other Antarctic stations and to Australia. I asked him to try to be active also on the DX bands; hopefully he will see his way clear to accede to our plea. The winter commences in April, when the Macquarie island population decreases to 18 solitary souls, and the island will have no ships' visits until October 1997. This is the period when there should be some amateur activity from the island.



Incidentally, ANARE celebrates 50 years of activity in 1997, as the first official research station was established on Australian Antarctic territory in 1947.

Future DX Activity

* Ed K8VIR plans to be active from FW, VK9, YJ, ZK2 and ZL7 during the next few months.

* Axel DL6KVA will visit Azerbaijan 4K and will be active from the station of Vlad 4K9W.

* Peter ON6TT, who was active as 5X1T, left Uganda to prepare himself for the Heard Island DXpedition.

* Eric FT5ZG was on his way to Amsterdam Island FT5Z on 5 November. He passed through Crozet and Kerguelen and was to arrive at Amsterdam at the time of writing of these lines (25 November). He will be using a TS-450SAT with an R5 antenna and no amplifier. His length of stay will be one year (although other sources say he will be there for only four months) and he will work as a transmission officer and postman. QSL manager is F5RQQ Jean Marc Vigilier, 14 Rue de Paul Helbronner, 38000 Grenoble, France.

* Matt DL3KUD will be active from the Azores from 30 December to 12 January as CU8/DL3KUD from Flores Island (IOTA EU-089). Activity will be on CW only on all HF bands. QSLs will be answered via the Bureau, no direct cards please.

* Pedro HK3JJH hopes to be active on 22 December or January 1997 from HK0

Serrana Bank (IOTA NA-133). These operations will last only six to eight hours.

* Mike NI7T intends to be active from Mongolia as JT1FBT in January 1997. QSL to home call.

* Dave WA5IKQ is active from Bosnia-Herzegovina as T9/WA5KIQ. His QSL manager is KH6BZF.

* Mako JA1OEM, a 70 year old Japanese amateur, will be active until mid January from Suriname (PZ) and French Guinea (FY). Planned callsigns are PZ1HD and FY/JA1OEM. QSL to home call.

* Boris IK4RSR will be in Colombia in January and will be active as HK0/IK4RSR from the islands of San Andres (NA-033) and Providencia (NA-049).

* Starting in December and continuing during 1997, Mark SP3GVX will be active from the station HF0POL, located at the Antarctic Polish Base Henryk Arctowski on King George Island (62° 10' S, 58° 32' W). He will operate mainly on the low bands. QSL to SP3FYM.

* Eric F5CCO was supposed to be active from French Polynesia. His trip was cancelled due to pressure of work.

Interesting QSOs and QSL Information

* ZF8BS – Bruce – 10140 – CW – 0720 – Oct (E). QSL via AA66KX Bruce B Sawyer, 15430 Bohlman Road, Isaratoga, CA-95070 USA.

* FW2EH – Dick – 10104 – CW – 1304 – Oct (E). QSL via DJ2EH Dieter Hornburger, Semmelgasse 3, D-96317, Kronach, Germany.

* FR5ZU/T – Jaques – 14164 – SSB – 0551 – Oct (E). QSL via VE2NW Zareh Amadouny, 18 Nisko, Dollard des Ormeaux, Quebec H9G 2R5, Canada.

* XX9X – 14205 – SSB – 0723 – Oct (E). QSL via OH2BH Martti J Laine, Nuottaniementie 3D 20, 022330 Espoo, Finland.

* T77BL – Luca – 14007 – CW – 1349 – Oct (E). QSL via Gianluca Bernardi, Via N Gavelli 7, RSM-47031, Serravalle D2, Republic of San Marino (Italy).

* XY1HT – Stig – 14195 – SSB – 1212 – Oct (E). QSL via JA8RUZ Toshikazu Kawanishi, Box 166, Asahikawa, Hokkaido 070-91, Japan.

* 9N1SON – Jack – 14215 – SSB – 1058 – Nov (E). QSL via W4SON Jack W Rucker, Box 837, Jamaica, NY-11430, USA.

* TR8XX – Jean – 7008 – CW – 0628 – Nov (E). QSL to Jean Claude Lupin, Box 4069, Libreville, Gabon, Africa.

* 5Z4BZ – Michel – 14039 – CW – 0544 – Nov (E). QSL via The Manager, PO Box 41784, Nairobi, Kenya, Africa.

* KH8/N5OLS – Don – 3799 – SSB – 1046 – Nov (E). QSL to Don Barclay, PO Box 250, Pago Pago, AS-96799, USA.

* BD5QE – Qiu – 21030 – CW – 0408 – Nov (E). QSL to Qiu, PO Box 519, Fuzhou, Peoples Republic of China, Asia.

* 3Z6AEF – Wald – 14037 – CW – 1333 – Nov (E). QSL via Polish QSL Bureau.

From Here and There and Everywhere

* What a way to celebrate a birthday! The well known DXer, Martii Laine OH2BH, attained the half-century mark in November. To celebrate the event he and a number of his DX operator friends congregated on Nauru Island, manned four stations using the collective callsign C21BH, and were very active on all the bands between 20 and 27 November. QSL to OH2BH (address in previous section of this column – see XX9X).

* All QSLs for EY1ZA, EY5OV, EY2Q, EY8CQ/R30, EY8AB, UJ8JCQ, and RJ8JAB must be sent via EY8CQ to Alex Rubtsov, Box 32, Moscow, 117449, Russia or via the Tajik Amateur Radio League QSL Bureau.

* If you are a devotee of Internet and your pocket allows it, look for DX news on the DXers UseNet group. The address is rec.radio.amateur.dx

* To celebrate the 1500th anniversary of the baptism of Clovis, a Frankish King, who was the first powerful ruler of the Merovingian dynasty, the founder of the French state and who defeated the last great Roman Army in Gaul, TM6CLO was active from 16-25 December only on CW. QSL via F5WA.

* The CY0AA QSL cards from the 18 June to 6 July activity are starting to arrive in the mail.

* PA3ASC reports that Dutch amateurs can now operate on 160 metres from 1.810 to 1.850 MHz.

* DP1KGI was the first and last amateur radio activity from the German Ardley Antarctic Base which will be closed early in 1997. The new base (Dallmann station) will be located at Juban Argentine base. The Gerge Foster base has been entirely dismantled.

* If you worked D44AB on 40 and 80 metres CW, it was a pirate. The genuine Daniel D44A8 does not work CW and has no antennas for those bands.

* Argentinian Novices can now use 3.7 to 3.75 MHz and 28.300 to 28.350 MHz on SSB.

* Bad news from Cape Verde. Daniel D44AB told Eric F5CCO that the Government of Cape Verde has placed a cost of $US351 on an amateur licence. Daniel wants information from other amateurs about the cost of the licences in their respective countries.

* It seems the Russian authorities issuing radio amateur licences have a soft spot for veteran amateurs. From 15 November until 10 December, RW9SG (ex-UW9SG) has operated as UE9SAA to celebrate his 50th birthday and 35 years of amateur activity.

* Warren VK0WH has corrected the total number of QSOs made from Macquarie Island (November '96 *Amateur Radio*). The total number was around 1200, and not 2500 as previously published.

* By the time you read this, the many problems concerning the VU2JPS equipment which was sent to Mani in August last year should have been solved. Jim VK9NS and HIDXA had several problems battling the "red tape of bureaucracy". Import duties, customs, transport, transfers and lots of "as soon as possible may be tomorrow" were the standard problems which delayed the receipt of the equipment.

* Gary VK8GW is moving to Brunei and hopes to be active from there soon.

* According to JA DX News an operation is being planned for April from Spratly Islands. JA9AG plans to operate as 9M0A or 9M0S.

* Jean Claude J28JA closed down his station on 26 August at 0225 UTC. Any contacts made after that date and time were with a pirate.

* QSL with AH8A is only direct and not via a QSL manager. Send your cards to William E Faulkner, PO Box 2567, Pago Pago, American Samoa, 96799-2567, USA.

* The Amateur Radio Association of Bahrain (ARAB) Club station A92C is on the air again, on the second and last Tuesday of each month for several hours starting from 1700 UTC.

* Antoine 3D2AG has not been heard in the past year or so. Antoine is doing his last year of studies in marine biology and hopes to be more active in the near future.

* According to the DXCC press release dated 6 November 1996, the number of unprocessed applications at the end of October was 604 (46,284 QSLs). They received 340 applications (25,602 QSLs) for endorsements and new awards during the month.

QSLs Received

OI/0/OH3TY (3 w OH3TY); A92GD (3 w K1SE); FY5YE (3 w W5SVZ); OX3SA (2 m op); CY0AA (5 m WD8SDL); VP9KK (3 w – K1EFI).

Thank You

Many thanks to my supporters who regularly supply me with news and information which makes this column possible. Special thanks to VK2XH, VK2JDM, VK2KFU, VK2TJF, VK8AV, VK9NS, VK0TS, WIA L40370, ON6TT, IPS Sydney, ARRL DX Desk, *QRZ DX, The DX Bulletin, The DX News Sheet, The 425 DX News* and *GOLIST QSL Managers list.*

*PO Box 93, Dural NSW 2158

ar

Over to You – Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Blinkers Again!

In Amateur Radio, October 1996, Frank Weber VK2XVJ seems to accuse me of wearing blinkers with regard to my view that it is unacceptable and dangerous to allow radio amateurs without knowledge of CW on to the HF bands, particularly the lower HF bands which are shared with professional users.

The main part of my argument that Frank seems to have conveniently ignored, in favour of pedantic criticism of my use of the term "LF bands" for 1.8, 3.5 and 7 MHz, is we share these bands with commercial and government users who often use CW as identifying beacon-type signals.

I find it astounding that VK2XVJ, involved with the NSW Emergency Services, refuses to acknowledge the dangers of letting loose people who have no knowledge of CW on to frequency allocations where this is still a used mode. I am sure that he would acknowledge the dangers of letting someone who knew nothing about firefighting near a bushfire!

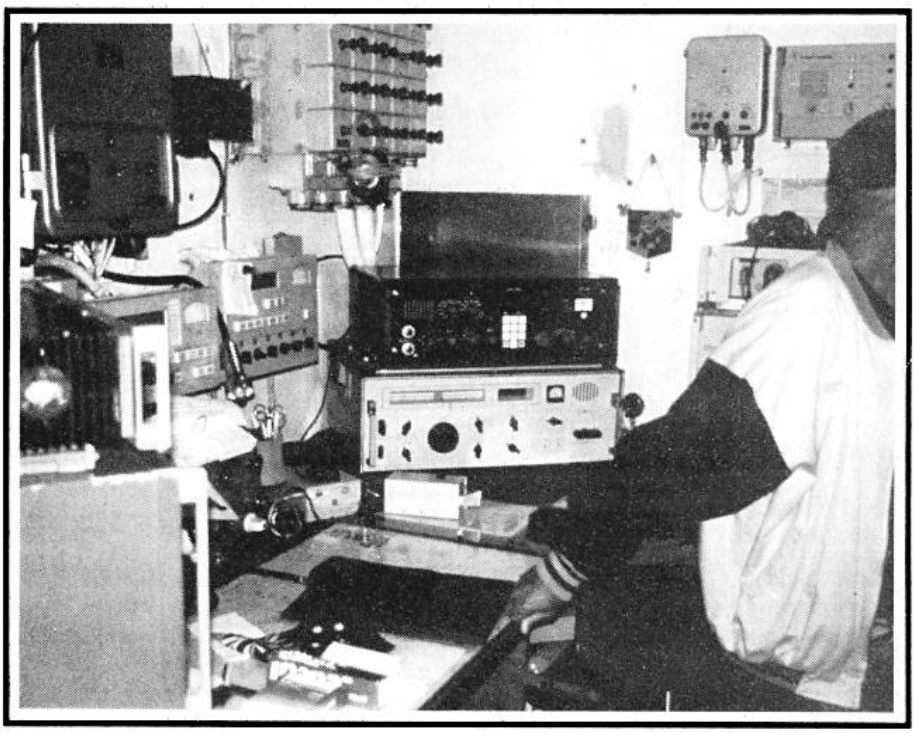
To put it bluntly, causing interference to a commercial or government user on a shared band might have personal or economic costs – nothing as severe as a loss of life, let us hope – and could cost radio amateurs and the WIA dear as far as our image in the wider community is concerned.

That, simply, is my point. I do not doubt VK2XVJ's skills and credibility as a phone operator and congratulate him on his bravery and certificate of appreciation from the NSW Premier. I am a WICEN volunteer myself and hope I acquit myself as well in an emergency as he obviously has.

However, Frank, I do feel you should take *your* blinkers off! CW is still widely used by commercial and professional users as well as radio amateurs – most of the 150,000 ships around the world still use CW, including the largest "tall ship" in the world, the SS Kruzenshtern.

Don't beat us, join us. After dealing with bush fires, CW should be a breeze and a lot more fun!

Steve Ireland VK6VZ
PO Box 55
Glen Forrest WA 6071



The radio room of the SS Kruzenshtern, the world's tallest "tall ship", taken on a visit to Fremantle during winter 1996. Note the electronic "bug" key. The 5000 tonne Kruzenshtern, a four masted, square rigged barque, belongs to the Russian Academy of Fishing.

Help With Atlas

I want to use the pages of *Amateur Radio* to make a plea for help from other amateurs. I have an old HF rig which has what I think is an AGC problem.

The rig is an Atlas 210X and the fault manifests itself in a zero reading of the S meter on receive. This is true even for strong local signals. Attempts to adjust the zero point of the S meter still leave me with zero deflection for all signals. The RF gain control has no effect. Associated with this is a distortion on all signals which ruins the usually excellent audio this set produces.

If you have an Atlas 210X and have had a similar problem with the rig, or even if you know of someone in Australia who can provide advice or service on these older rigs, I'd appreciate a call. I am QTHR in the last couple of call books or you can phone me on (06) 258 1228 most evenings. If you have e-mail access I can be reached at *rjenkins@pcug.org.au* or if you have packet I can be reached at *vk1rj@vk1bbs.act.aus.oc*

I am keen to get this old rig going again, so if you can help, please drop me a line.

Richard Jenkins VK1RJ
PO Box 101
Charnwood ACT 2615

Thanks from 9V1

Thank you very much for sending me a copy of the October issue of *Amateur Radio* which includes the item about Singapore's Quarter Century Old Timers, and for the return of the photo. Please also convey my thanks to all concerned. I must apologise for the delay in writing as I was out of Singapore.

I have received several letters from VK ham friends mentioning the write-up and photo and they were glad we are still active after all these years, especially from the VKs who had not heard from us for some time.

There are only two minor corrections, that of Ong Huck Jin 9V1RA and my address at 63 Jalan Ma'mor #01-59 Singapore 320063, but I am sure the photo said a thousand words and brought back fond memories for our friends now living in Australia.

I had the opportunity of visiting Australia about two years ago, making leisurely visits to all the coastal towns and cities from Melbourne in the south to Cairns in the north. I was happy to be able to meet several ham friends, particularly in Sydney as I was studying there way back in the early sixties. My mother and two sisters have been living in Australia for over ten years and my visit was especially a happy get-together.

Hope all you good folks are keeping well.

Joe Seah 9V1NQ
ar

Packet World

*Grant Willis VK5ZWI**

Understanding What the Computers Are Doing in a Packet Connection!

or

What Do All Those Headers Mean?

1.0 Introduction

Have you ever wondered what all the different packets actually mean when you connect to someone on packet radio? This short description should give you a clue as to what is going on. Being able to understand, even in a limited way, what you are seeing when monitoring a packet channel, can help you diagnose problems in your packet station. So, first up, let's look at the types of packets that are commonly seen.

2.0 Basic Packet Types

(1) Controlling Connections – Connect and Disconnect Requests and Acknowledgments

Connect Request packets are sent by the calling station to initiate a packet link between two stations. Connect Requests are answered by the station being called with "UA" packets, known as "Un-Numbered Acknowledgments". These packets tell the calling station that the station being called accepts the connection. They are un-numbered because there is no packet sequence number, unlike "Information" packets discussed later. The only other packet type that will result in a "UA" packet being sent is in response to a Disconnect Request Packet. There are two types of disconnect packets. The first type is used when two stations are already connected and one station wishes to disconnect from the other. In that situation, a DISC packet is sent, which is replied to with a UA.

Example 1
Connect Request Packet Format
[callsign] to [callsign] ctl SABM+
Disconnect Request Packet Format:
[callsign] to [callsign] ctl DISC+
Un-Numbered Acknowledgment Packet format:
[callsign] to [callsign] ctl UA-

The other type of disconnect packet is a DM packet, which is the equivalent of a Busy Signal. This occurs when station C tries calling station A who is already connected to station B. In this case, station A will send back a busy packet to station C and then carry on communicating with station B.

Example 2
Busy Signal Format
[callsignC] to [callsignA] ctl SABM+
[callsignA] to [callsignC] ctl DM-
[callsignA] to [callsignB] ctl I01+
{packet message continues to station B from A, C Sees Busy Signal}
[callsignB] to [callsignA] ctl RR01-

Depending on the packet programs that other stations are running, some will report to their operators that someone tried to connect to them when they respond with a busy DM packet, while other programs will just respond to the remote station and not notify the operator.

(2) Sending Packet Data – Information Frames

Information or Data packets are used to exchange the actual information between two stations. They can vary in length between one and 256 bytes or characters of information.

One of the problems in a packet radio type system is to make sure that the data arrives in the right sequence. To solve this, Information Packets are numbered, so that when they are received they can be reassembled in the right order and, if one packet is missed, the missing one can be determined and the receiving station can ask it to be repeated. In Amateur Packet Radio, the packets are numbered from 0 to 7, and a maximum of seven packets can be sent in any one transmission. After seven packets are sent, the sending station must receive an acknowledgment from the receiving station saying that they all were received so that the next seven packets can be sent. If there are errors, processes to correct any errors are begun.

Example 3
Information Packets look like:
[callsign] to [callsign] ctl I00v
The cat sat on the mat
[callsign] to [callsign] ctl I01v
The cow jumped over the moon.
[callsign] to [callsign] ctl I02v
The lazy fox jumped over the old dogs back
[callsign] to [callsign] ctl I03+
Do what you want to do, be what you want to be.

(3) Verifying Data was sent correctly – Acknowledgments, Rejects and other things

After a maximum of seven packets are sent, the receiving station must send back an acknowledgment. If no acknowledgment is received within a specific timeout period (called the FRACK timeout or frame (another name for packet) acknowledgment timeout), then the sending station will POLL the receiving station with an acknowledgment packet containing the packet number from the past packet received by the sending station.

Example 4
Acknowledgment or Receive Ready Packets
[callsign] to [callsign] ctl RR02-

Receive Ready packets contain the packet number of the last successfully received piece of data from the sending station plus one.

(4) Packet Acknowledgment – REJECTED frames

Example 5
REJect packets look like:
[callsign] to [callsign] ctl REJ01

If a frame gets missed by the receiving station, or there is an error in decoding the frame, then the packet is rejected and every frame after the reject is discarded.

Reject packets are sent when an error is detected. They contain the fact that there was a rejected packet, and they also inform the sending station of the last successfully received packet. In the case of the example below, the packet that was missed was number two. The last successfully received packet was packet one; so, because an error was detected, a reject frame was sent with it's number set to two, which tells the transmitting station to start sending the missed packets again, from packet number two onwards.

Example 6
[callsignA] to [callsignB] ctl I00v
The cat sat on the mat
[callsignA] to [callsignB] ctl I01v
The cow jumped over the moon.
[callsignA] to [callsignB] ctl I03+
Do what you want to do, be what you want to be.
[callsignB] to [callsignA] ctl REJ02v

(5) Other types of packets – RNRs, FRMRs and UIs

RNR = Receive Not Ready – sent when the receiving stations buffers are full and cannot accept any more traffic. The sending station polls with RR packets until the RNR is replaced with an RR packet.

FRMR = Frame Reject Packet – this occurs when there is a serious protocol error. This is very rarely seen, but most commonly occurs when two stations using the same callsign are active on the same channel.

UI = Un-Numbered Information Packet – this is the same as an Information packet except that there is no sequence number transmitted. This is used to "broadcast" information such as the FBB mail listings, ID Beacons, etc. No error retrying can be done by receiving stations on missed UI frames.

3.0 Basic Packet Parameters

You need to be aware of a number of key basic packet parameters which can have a major impact on the operation and efficiency of your station, as well as what impact you have on others on the same shared frequency. Careful consideration of these parameters is required to ensure the best performance of your station.

TXDELAY – Transmitter Key Up Delay

When your TNC or BayCom equivalent software keys up your radio, it makes an allowance for the time it takes not only to key up your own radio, but also the average time it takes to open the receiver mutes at the other end. This waiting time is set in milliseconds either in your TNC or in your packet radio software. During the TXDELAY time the TNC sends out "flag" characters which signify the start of a packet. The TXDELAY also gives time for relays to pull in, or for synthesisers to settle down on to the correct frequency.

Problems that occur in setting this parameter usually manifest themselves in unreliable connections or in connections dropping out. If the parameter is set too short, you won't achieve a connection at all. Setting the parameter to be too long reduces the efficiency of your station by taking longer to send each and every packet. The way to adjust the parameter is either start too short and gradually lengthen it until you get reliable connections (assuming all your deviation and receive levels are correct), or start too long and gradually cut it back until connections become unreliable, and then set it back a couple of steps to make sure they are reliable.

Typical values depend on the quality of your radio. Generally 250 to 400 mS will cover the most commonly used radios. If you are using higher speeds than 1200 baud, it is better to pick radios that do not require as long a delay (so as to maintain packet efficiency). Typical values for 4800 baud are around 80-150 mS while at 9600 baud, you should use 10-30 mS. There will be times when your transmitter can switch faster but you can't actually set your TXDELAY to that value directly. The reason for this is that the receiving station's mute also needs to operate and have detected your transmission within the TXDELAY period, so in some cases other stations' receivers will be the limiting factors, not your transmit delay.

PACLEN – Packet Information Frame Length

The PACLEN command sets the maximum number of bytes you will transmit in any single information frame. The protocol limits the size of packets to 256 bytes. Generally, for good sharing of packet channels, PACLEN parameters should be set around the 128 byte mark, although, if you are doing file transfers, it is better to set it to 256 bytes. If you are using HF packet, the recommended length is a lot shorter (due to the probability of errors over a noisy HF path). HF packet lengths should generally be between 40 bytes and 80 bytes maximum when running 300 baud, or 128 bytes maximum when running 1200 baud PSK.

MAXFRAME – Maximum Number of Frames per Transmission

The MAXFRAME parameter sets the maximum number of frames that you will send in each transmission. This will determine the maximum time your transmitter is on air during any one transmission. The maximum permissible value is seven (due to the frame numbering described above). Best values are between two and five. Setting this parameter too high will result in your station hogging the packet frequency and slowing down anyone who is using the channel for interactive sessions (eg keyboard contacts or server activities online on a BBS). Setting it too low reduces your station's efficiency when uploading large blocks of data.

FRACK – Frame Acknowledgment Retry Timer

This timer sets the waiting period between sending a packet, and resending the same packet if no response is received. When you are sharing packet channels, it is good practice to set the FRACK to be relatively long so as to give everyone else on the frequency a fair go. Generally FRACKs around 4-6 seconds are used, with longer FRACK times for busier channels.

Problems can occur with the FRACK timer if it is too short, in that retries may occur coincidently with the receiving station keying up its transmitter to send the reply to the original frame. This causes a collision, and hence data loss and a reduction in efficiency. FRACKs that are too long can make packet radio very boring, as you wait for ever for data to be retried.

RETRYS – Frame Retry Counter

To prevent your packet station from trying forever to connect to a station that has either failed or was not on air at the time, a counter is included in the packet system to limit the number of tries that you will make to send a particular packet. If the RETRY counter is exceeded, then your station will automatically disconnect. A typical value for RETRY is between 10 and 15. Any higher generally causes too much congestion on a channel, while any lower may cause premature disconnects on congested channels.

RESPTIME – Response Timeout Timer

The RESPTIME timer command is a bit variable between different types of TNCs and different software TNC programs. Its formal definition says that it is the time a station must wait before sending an RR frame in response to a transmitted I frame. The purpose of such a timer is to stop your station from sending an RR packet to each transmitted packet frame sent in one batch. For example, if your RESPTIME command is set to zero, you may see behaviour like:

Example 7

VK5TTY to VK5ABC ctl I01v
ryryryryryryryryryryryryryryryryryryryryryry
VK5TTY to VK5ABC ctl I02v
ryryryryryryryryryryryryryryryryryryryryryry
VK5TTY to VK5ABC ctl I03v
ryryryryryryryryryryryryryryryryryryryryryry
VK5TTY to VK5ABC ctl I04+
ryryryryryryryryryryryryryryryryryryryryryry
VK5ABC to VK5TTY ctl RR02v
VK5ABC to VK5TTY ctl RR03v
VK5ABC to VK5TTY ctl RR04v
VK5ABC to VK5TTY ctl RR05-

If RESPTIME is set to slightly greater than the time to send a packet of maximum length, the extra RR??v packets will not be sent. Generally for 1200 baud, this equates to around 2000-2500 mS.

DWAIT or SLOTTIME/PPERSIST – Channel Access Control Parameters

Channel access control parameters are all about controlling the timing of the decision when to key up your transmitter. DWAIT was common on older TNCs and was generally a fixed value that your TNC would wait before keying up after seeing that the channel was

clear. This value was usually in mS and typically is best set between 320 and 500 mS. Shorter times are possible, but they also make your station hog the frequency, to the exclusion of other users.

SLOTTIME/PPERSIST work together to set up a more random channel access timer. PPERSIST is a probability factor, defined as a fraction of 256; ie a PPERSIST value of 64 gives a probability of 0.25 (64/256). The probability sets the likelihood that, given a clear channel, you will actually key up your transmitter. A test to see whether there is a clear channel is performed by your TNC every "slottime" milliseconds. To allow for all users on a frequency, the software authors recommend that SLOTTIME be set to the same value as TXDELAY. I have found this doesn't always yield the best results. Typically values around 150-250 mS have been found to work best.

The best values for PERSIST are around 40, which gives a reasonable compromise between efficiency and channel sharing. Indeed, the probability factor is supposed to be selected based on 1/(number of simultaneous users + 1).

4.0 Conclusion

Hopefully, I have given some clues as to things to look for when watching your packet station's behaviour on air. The efficiency of the channel you are using for all stations can be drastically affected by how well your station is adjusted. You can become a channel hog, or always find your own station being disconnected, all through poor parameter settings. Unless you have some basic understanding of what the various packets you monitor are doing, it can be very difficult to decide on what is the most effective parameter to adjust.

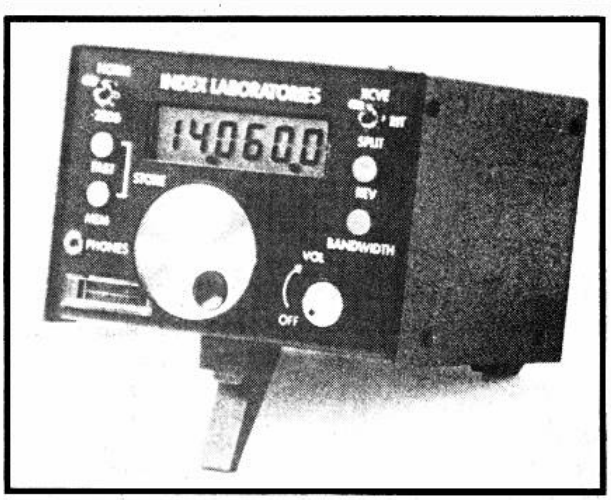
If you continue to run into problems, try contacting one of your local amateur radio clubs, or packet BBS operators. They should be able to give some assistance if you are having problems.

C/o GPO Box 1234, Adelaide SA 5001
Packet: VK5ZWI @ VK5TTY.#ADL.#SA.AUS.OC
Internet: gwillis@dove.mtx.net.au

ar

Pounding Brass

*Stephen P Smith VK2SPS**



QRP Plus transceiver.

In 1995 I read an interesting article in a *CQ Magazine* in relation to a new QRP transceiver that was soon to be released by the American Company "Index Laboratories". The transceiver was to be called the "QRP-Plus".

The features offered in this transceiver were similar to those in medium priced base station units. Some of the features included general coverage receiver tuning from 1.8 to 30 MHz in either SSB or CW; all band transmit 160-10 m SSB and CW; full break-in operation and built-in iambic keyer; SCAF filters; variable bandwidth, and RIT and split frequency operation, just to name a few.

I have a number of home-built units that cover various bands but nothing compared to what the QRP Plus has to offer. I made a quick decision and parted with my FT-101 which helped to cover the cost, etc. Several weeks later, after corresponding with Index Laboratories, I received my new QRP Plus transceiver.

The QRP Plus comes with a well laid out, easy to read, 24 page instruction booklet, some 3.5 mm plugs for either key or keyer connections, and a spare fuse and power cord for connection to a 12 V or 13.8 V DC supply.

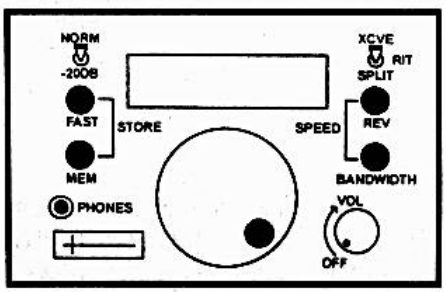
Power

The QRP Plus can run from a 12 volt battery for portable use, or a 13.8 V DC supply for base station operation. The supply should be able to supply 1.5 A or more at 12 V DC for full rated output power. The unit can be damaged if the voltage exceeds 15 V DC and will shut down if the supply drops below 11 V DC.

Reverse connection of the power cable will not damage the unit but will blow the protective fuse located at the rear of the unit. The fuse is a standard 3AG 4 amp fast-blow, common in most electronic stores.

Antenna

Antenna connection is a standard SO-239 connector located at the rear. Whilst most solid state transceivers usually reduce output power when looking into a high VSWR to save the output transistors from damage, this is not so with the QRP Plus, as stated by the manufacturers. In any case, I wouldn't recommend it. If in doubt use a tuner.



Front panel layout of the QRP Plus.

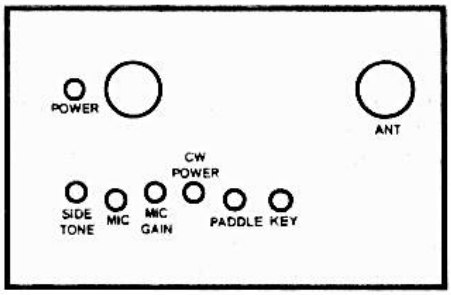
Front Panel

The layout of the controls is neat and, after a little practice, they are easy to use. The OFF/VOL control switches the unit on or off, and also controls the loudness of the received signals into the speaker which is mounted in the top of the case. When the unit is first switched on, the serial number is displayed for about three seconds before the frequency of operation is displayed.

I did find the volume to be somewhat lacking in strength especially in the presence of background noise. However, I found using Walkman style headphones improved reception greatly.

Tuning from one frequency to the next is achieved by holding down the memory button and rotating the main dial until the desired frequency is reached. Holding the bandwidth button sets the receiver bandwidth from 2.4 kHz down to less than 400 Hz by rotating the main dial. Pushing BANDWIDTH and REV buttons simultaneously sets key speed from 10 wpm to 45 wpm. If you are subjected to interference the attenuator will be of great help as it has about -20 dB of attenuation. Under general conditions the switch is left in the upright position, NORM for normal.

Normal tuning rate was measured at about 4 kHz per revolution. To increase the tuning rate to more than 100 kHz per revolution, the fast button is pressed and held while rotating the main dial. The earphone socket is mounted on the front panel and takes a



Rear panel layout of the QRP Plus.

standard 3.5 mm stereo plug. Standard Walkman headphones were used for most of the tests.

The QRP PLUS comes with 20 memories as standard with some pre-set at the factory. To set a memory, you go to the band in question (as outlined before) push and release the MEM (memory) button, tune in the frequency you wish to store, then depress and hold the FAST button while pushing the MEM button. This is all that's needed to store a frequency. After a little practice this operation becomes second nature.

The "S" meter acts as a power meter on transmit and a signal meter on receive. At the top right is the XCVE, RIT and SPLIT switch which is a handy little item to have. In the XCVE position the unit transmits and receives on the same frequency. In the RIT position the transmit frequency remains fixed while the receive frequency can be varied. If you wish, push the REV button while in the RIT position and the transmit frequency will be displayed and can be tuned while the receive frequency remains fixed (XIT). To change from SSB to CW it is just a matter of depressing the FAST button while holding down the BANDWIDTH button and vice versa.

Rear Panel

The rear panel contains the sidetone level adjustment which sets the CW pitch, as well as the power output control which varies the output from about 500 mW to just over 7.5 watts. Input sockets for a standard straight key, paddle and microphone all take the standard 3.5 mm plug. The microphone gain control is also on the rear panel.

Power Output

Power output was measured with the following results:

Freq MHz	O/P Pwr	Tx Current	Rx Current
1.8	4.8 W	304 mA	33-35 mA
3.5	5.0 W	306 mA	33-35 mA
7.0	4.5 W	314 mA	33-35 mA
10.1	5.5 W	335 mA	33-35 mA
14.0	5.0 W	351 mA	33-35 mA
18.1	5.0 W	359 mA	33-35 mA
21.0	4.5 W	330 mA	33-35 mA
28.0	3.0 W	279 mA	33-35 mA

The QRP Plus measures (L) 16 cm x (W) 14 cm x (H) 12 cm.

On Air

On air tests with other amateurs proved successful with a clean chirp-free signal to most Northern States. I was extremely pleased with the units handling ability and can recommend it to QRP operators as a quality transceiver.

With a price tag of $US695 it is not a cheap item. A new version has just been released with some modifications. Enquires can be made to: Index Laboratories, 9318 Randall Drv NW, Gig Harbour, WA. USA 98332, or phone 206-851-5725.

The only down side to this unit I found to be the lack of volume from the speaker; no microphone (has to be purchased separately – takes the commonly available speaker microphone of the type sold for use with FM handhelds); the "S" meter has no display light and one has to bend down to be able to read it.

Next month a look at the MFJ Grand Masters II Contest Memory Keys.

*PO Box 361, Mona Vale NSW 2103

ar

Repeater Link

*Will McGhie VK6UU**

Alaska

The article about getting on the Internet continues to generate considerable e-mail. One of particular interest was from an Alaskan amateur. It appears *Amateur Radio* is even read in Alaska!

In part the e-mail was a request to reproduce the particular article in the local amateur magazine. Now that's coverage for *Amateur Radio* magazine. I don't know many details about how *Amateur Radio* is received in Alaska, but I'm attempting to find out. The original e-mail was brief; possibly the detail came from a third party, who was on holidays.

More Fee Rises

As of writing, the fee structure for repeaters and beacons has changed. We were still trying to come to terms with the previous changes and subsequent increase, when along comes another. Please note the comments that follow are mine, with input from other concerned amateurs, and may not always be entirely accurate, or necessarily have a total grasp of the situation. But it is my opinion on what I believe to be the current situation.

Just over two years ago, repeaters, beacons and digipeater sites were charged on a $37 per callsign per site basis. Any number of transmitters that were all at the same site, and shared the same callsign, attracted a $37 fee in total. Some of our sites in VK6 had several systems, but the total fee per site was $37.

Then a big change! No longer could you licence several systems under the one call and expect to pay the single fee of $37. The common callsign could remain, but each transmitter would now cost $24 per year. Our largest site in Perth has some 10 transmitters, hence the fee went from $37 to $240. But now it is to increase to $500!

Why are the licence costs going through the roof? The information from the SMA explaining the fee increase can be simplified to recovering costs and making money for the government. Now you cannot argue the "making money for the government" issue easily. It is a political decision and would have to be fought at a political level. I imagine the SMA probably have little control over this.

On the first point, recovering cost, we are told this at every increase in licence fees. But the latest fee increase is over 100%! Have costs gone up over 100% since the previous licence fee rise to $24? In the space of less than two years, licence fees for repeaters and beacons have gone from $24 to $50.

One must speculate, in the absence of detailed information, that either the rise to $24 did not reflect the true costs the SMA incurred in licensing repeaters and beacons, or the Government wants more, or the SMA came up with the wrong $24 figure two years ago. And is this the last rise of such magnitude? Will the licence fees for repeaters and beacons go up to $100 in another year or two? Is this $50 fee the final true cost recovery figure? It would not be unfair to have limited faith in the SMA's ability to do its sums, based on all the changes.

WIA

"Where is the WIA in all this?", I hear you say. The first news came in a brief memo from the SMA simply announcing the new fee scale without prior consultation. It took a follow-up memo to "explain" the reasons for the fee increase.

The Institute is currently gathering, as a matter of urgency (or by now has gathered), data on the severe impact that the new fee structure will have on Amateur Community groups that provide Repeater and Beacon Services. Armed with this information, the WIA is to seek consultation with the SMA on ways to quickly achieve a sensible, affordable, technically based solution in this matter.

Memos

What was in these memos? I have the explanatory one in front of me, entitled "Revised Licence Fees and Charges". In part, the explanation for the fee rise is changes to the consumer price index (2.7%) and to recover costs associated with Australia's membership of the ITU. The percentage increase for ITU participation, the memo states as 1%. Not a big increase so far. The next reason given for the fee rise is "A Government decision to fund a program of research and public information on health issues associated with electromagnetic emissions". Cost 1% on most licences. Still no big increase yet.

Reason four is *"Changes to the fee structure arising from the post-implementation evaluation"*. An example is given to explain this "Yes Minister" language. *"There have been some amendments of bandwidth ranges in the fee structure to promote spectrum efficiency and better reflect spectrum planning arrangements"*. No percentage mentioned in this one, and what has this to do with amateur bands, anyway? It does not matter if amateur transmissions are spectrum efficient or not. I can't see how this equates to a fee rise for repeaters and beacons.

And the final one, and it is a big open ended one! *"Actual costs incurred by the SMA."* It is worth quoting this one in full. *"The charges for SMA tasks such as issuing or renewing, which were set in April 1995, were based on best estimates of the average time taken to perform these tasks. Following detailed surveys of the time taken to issue or renew each licence type, the charges have now been accurately set on the basis of the actual time taken. The SMA has also moved to standard charging for licence issue wherever possible to provide licensees with greater certainty when applying for new licences."* One could spend a lot of time examining this statement.

The first part that sticks out is *"The charges for SMA tasks such as issuing or renewing, which were set in April 1995, were based on best estimates of the average time taken to perform these tasks."* Best estimates I gather proved to be a poor best estimate. If all the previous explanations as to the fee increase, such as ITU participation, only amount to a few percent, then the "best estimates" was out by almost 100%. What faith can we have in the new estimate? Will we see another revision of the "best estimate" some time down the track?

Further, part 5 says, *"Following detailed surveys of the time taken to issue or renew each licence type, the charges have now been accurately set on the basis of the actual time taken."* Does this mean that the previous licence fee for repeaters and beacons of $24 was not accurately set on the basis of the actual time taken? So how was the original $24 worked out?

And the last part of part 5 says *"The SMA has also moved to standard charging for licence issue wherever possible to provide licensees with greater certainty when applying for new licences."* What does "greater certainty when applying for new licences" mean? Were we amateurs uncertain when applying for new licences? "Yes Minister!"

Five Year

The five year option is reported to result in savings. In the Repeater Group's situation of having to pay about $1,100 per year, the five year licence fee, even though cheaper, exceeds the total funds the group have available, so it is not an option. In our situation the cost for five years is $3,740! I know I would be very reluctant to pass on any extra money, even if it may result in long term savings. In these times of constant change with licensing fees, who knows what the future holds? I would rather spend my time fighting the current new fee.

In VK6 we are now looking at over half of the Repeater Group's annual income of about $2,200, being spent on licence fees! That is a lot of money. The local VHF Group in VK6, who maintain the beacons, look like paying all their yearly income on licence fees!

And on the now departed $91 per hour new licence fee, don't think this is a major cost saving for repeater and beacon sites. It only takes three years for the new $50 flat fee to

overtake the previous $91 per hour plus $24 per year from that point on.

Yet another question is, what costs are involved for a change of location or callsign of an existing repeater or beacon under the latest changes?

Changing a Word

Also of interest is a change in wording in the way a licence is defined. A licence was required per transmitter, now it is per transmitter frequency. A small play on words you might think, but it does result in increased cost to the amateur community. For example, a digipeater may be required to change frequency, as was the situation in VK6 to forward traffic. Under the previous fee system it was $24 per year; under the new system it is $100 per year. Subtle but costly!

Added to this is the incredible cost of licensing the new International HF Beacon for VK6. This HF beacon operates on a time sharing basis on five bands from 20 metres to 10 metres. Now, it is one transmitter at one location, but the cost to licence this beacon for the first year is $250! That's right, five frequencies times $50, yet it is only one transmitter. How a slight change in wording can be so costly!

I don't accept this fee rise, and I don't accept the reasons given. If the fees for repeaters cannot be set at a proper level, then new and existing repeater systems will be reduced and amateurs will be burdened. And why do we have fees for beacons and repeaters in the first place? In all other services, other than amateur radio, it is obvious that there has to be frequency planning and interference minimisation. But with amateur radio I cannot see this having relevance. Any amateur can operate on any amateur band that his or her licence allows without requiring frequency planning by the SMA. To further point out the inconsistency, licensed portable repeaters can be set up anywhere for a period of one week without notifying the SMA. That's right, a portable repeater can be set up and operated without any frequency co-ordination for up to one week, yet a permanent one cannot. This is technically inconsistent if interference concerns are the primary concern.

Reaction

What reaction has there been so far from amateurs directly involved in the management of repeaters and beacons? Most condemn the rises but a few see advantages. These advantages are based on specific examples, usually involving large up-front new licence fees. One packet bulletin I saw mentioned an installation fee of over $300. Under the new system the fee would only be $50. No doubt, it is a big difference. But it is the $300 fee that is to be queried. This was on a site in VK2 with no other services. This fee level has not been the experience in VK6, with $91 being the usual fee.

However, it is important to look beyond the isolated situation and ask what is the effect on amateur cost overall. The number of repeaters in service is about 620. This equates to a cost increase from the $24 system to the $50 system, of $14,880 to $31,000. That is, for repeaters alone, an extra $16,120 in yearly licence fees. With the previous fee structure, if 10 new repeaters on average go into service each year, the annual cost due to the $91 per hour could be as low as $910, or perhaps as high as $3,000. This is a poor trade-off. I don't know if the 10 new repeaters per year is an accurate figure, but I do believe the new fee structure will cost amateur radio a lot of money.

All in all, a poor show! These fee rises, coupled with the long delay in the "new repeater regulations" and the silly regulations that apply to repeater systems that prevent clever experimentation, have to be challenged long and hard.

21 Waterloo Crescent, Lesmurdie 6076
Packet: VK6UU @ VK6BBR
E-mail: will@vale.fanoc.com.au
ar

Spotlight on SWLing

*Robin L Harwood VK7RH**

The propagation conditions are rapidly improving, judging by recent monitoring over the shortwave bands. The higher frequencies are starting to open up after their solar slumber. The 14 MHz CW allocation really burst into life over the weekend of 23-24 November during the "CQ Worldwide" CW contest. The conditions were excellent with propagation holding up well over the entire period. European and American operators were well heard here, mixing with the Asian and Pacific regions. As a lover of the key, it was pleasing to hear the CW portion crammed full of feverish activity, yet frustrating that I was not able to participate. Although propagation remained good, activity on the above segment dropped off dramatically after the "WW" concluded. Never assume that the band is dead, simply because you can't hear anybody there. Just call CQ and be amazed.

I noticed that the United Arab Emirates Radio in Dubai is no longer broadcasting in English. I often tuned in to get the 0530 news on either 21700 or 13685 kHz but now they only use Arabic. To balance this out, I believe that Amman in Jordan has increased their English output between 1300 and 1700 UTC, but I do not know their frequency in the 25 metre band.

In December a significant milestone in the history of radio went by almost unnoticed. It was on Christmas Eve 1906 that one of the first transmissions of speech over wireless took place in Boston. The gentleman concerned was a Canadian researcher, Professor Fessenden, and it was on about 88 kilohertz. I recollect reading about this in a reading primer when I was in primary school. It described the effect of hearing speech for the first time and the incredulous reaction from the wireless operators at sea. I would like to see this article again as it was a catalyst to my involvement in radio listening. Can anybody please assist me in tracking the article down?

Recently, while I was tuning above the twenty metre band, I came across one of those signals which are referred to as "Numbers stations". These stations broadcast strings of five figure groups, usually read out by a female announcer and repeated twice, "27454 27454 79328 79328", etc. These stations have been around since the Second World War and are engaged in intelligence work. The signal that attracted my attention was on 14487 kHz at 1225 UTC and was in English with a very prim and proper pronunciation which easily identified the source of the transmission. However, it was not the actual content of the messages that was significant but the deliberate jamming that had been thrown up at the signal. The nature of this deliberate interference is identical to that I have heard emanating from the Middle East on Farsi and Arabic broadcasts from the VOA and the BBC.

I have been informed by e-mail that the source of the transmission is Cyprus from an RAF base whilst the jammers are in Iraq or Iran. I would have thought that if these cypher signals are secure, they would have moved their frequencies about to avoid this jamming but they are still persisting on the same channel. I could only put up with it for a few minutes, yet they were still going 90 minutes later.

Incidentally, one of the last remaining press services on RTTY has closed down on shortwave. On 31 December the Xinhua Newsagency in Beijing went to satellite and the Internet, thus leaving only North Koreans as the remaining newsagencies on RTTY. It is a far cry from when I first commenced reading RTTY in 1983, when press copy was easily received. Now all you can find are the thoughts of a dead political leader! C'est la vie!

5 Helen Street, Newstead TAS 7250
VK7RH@VK7BBS LTN.TAS.AUS.OC
Internet e-mail: robroy@tassie.net.au
ar

VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

VK Six Metre Activity

Overall, there appears to have been a slow start to the Es season. A number of contacts have been made across various State boundaries, as listed in these notes, but no sustained operation for long periods. Despite this, I have a feeling that we are in for a good Es period during summer and that those conditions may continue later than the usual cut-off sometime in January. Certainly that has been the case in the Northern Hemisphere where openings have occurred as late as November (our May equivalent).

From **Glenn VK4ZTL:** 13/11: 0930 VK3CNX 5x9, 0940 VK3DUT 5x7, VK3XQ 1018 5x7, VK5HS 1101 5x5-7. VK3s noted on 52.525 from 0900. 14/11: 2306 VK3DUT, 2320 VK7RNW/b 5x5, VK1MJ 2330 5x9 on 29.600 FM. 1320 ZL1TDA 5x9 using local repeater in Auckland on 146.625 FM. 1333 ZL1WTT 5x9 via 146.700 ZL repeater. 1340 ZL1QF 5x9 via 146.700 also. 15/11: 0010 VK2AIF 5x9 on 50.120.

John VK4KK advised that on 14/11 an early morning opening on six brought VK5s working VK4s with Hugh VK5BC working Ron VK4BRG at 2130.

[Comment: I have noted Ron's beacon on 50.077 MHz almost daily throughout November, usually from 0100 for several hours, signals varying from S1 to S9, but little else ... de VK5LP.]

Steve VK3OT phoned to say the first signs of E Layer summer for 1996 occurred around 0800 on 15/11 with 28.230 ZL/b 559, 45.260.9 +/- and 45.2396 +/- TV video from east, signals 559 to 599 with QSB. No sound on 50 MHz at time of message.

New Zealand

Cliff Betson ZL1MQ writes from New Zealand that, apart from the odd appearance of beacons, signals from VK have been scarce. Contacts so far have been: 23/10: ZL3AAU to VK2FZ/4; 5/11: ZL3NE/1 to VK4AFL; 8/11: ZL2AGI and ZL2KT to VK2DN, ZL3NE/1 to VK4AFL, VK4APG; 9/11: ZL3NE/1 to VK2DZ, VK2NZ, VK2GF, VK4GP, VK4KFQ, VK4JSR and VK4AFC.

Cliff also wrote: *"With the advent of another channel for TV3 on VHF there was concern amongst six metre operators that the obsolete Ch 1 was to be used. However, the allocations are Auckland Ch 9 (H), Wellington Ch 10 (V), Christchurch Ch 11 (H), Dunedin Ch 11 or 13. Repeater channels on 2, 5, 7, 9, 10, 12 and 13, the latter two being new to TV.*

"There is also an allocation of a TV channel for Multi-plex TV which, on the present standards, is 8 MHz wide and accommodates four TV stations in that bandwidth, and would require a new TV set or an adaptor for present TV sets."

Amateurs in areas where Ch 9 operates will need to be aware that the fourth harmonic from 50 MHz lands very neatly in the passband of that channel with consequent risks of TVI. Some will find they will need to operate with reduced power to minimise such problems. Areas where Ch 9 is strong will not be greatly affected but, from about 100 km outwards from the station, ten watts at 50 MHz will be as much as many TV sets will tolerate. Just thought you would like to know!

Confirmation of 5.7 GHz Record

Last month I reported the contact between **Al VK6ZAY/6** and **Alan VK6ZWZ/6** with the possibility that it was an Australian record. **John VK3KWA** now confirms he has accepted the contact as a new VK6 and national record, the amended distance being 236.0 km.

Bob VK2DN advised that: *"On 8/11 around 0608 six metres arrived for this season in Blaxland, and I worked a number of ZL2 stations in Hastings.*

"On 9/11 ZL TV was over S9 for about 14 hours. I worked ZL3NE in Auckland and copied the ZL3SIX beacon at good strength. I heard several VK4s about lunchtime at S9 working VK2s and Bob ZL3NE said he had worked some VK4s. He also said he had heard a CW station with 9.. briefly to north, but couldn't pick if it was a JA9 or a VK9."

VK3SIX/b at Hamilton on 50.0535 is no longer available to me at Meningie as a weak signal beacon due to a computer birdie, from somewhere in the town, which is S5 on the frequency. There is another very strong computer birdie on 50.112 but so far 50.110 remains clear. In total, there are at least fifteen such birdies between 50.000 and 50.200 ranging in strength from S2 to S8. All can be peaked by rotating the antenna.

With the school holidays soon upon us the trouble can only become worse! Then, of course, there is the strong signal from a baby-minder varying from 49.750 to 49.830. So much for the limited coverage of such unlicensed devices; the one I hear is about one km from me.

DXpedition to VK3

David VK5KK sent an e-mail to say: *"After being granted a visa from the VK3s, enabling me to take microwave gear across the VK5-VK3 border, Scheryl and I planned to make a trip to Mt William (1197 m asl) to see just how well that site worked without propagation on ALL the amateur SHF bands (yes, that's right, 3.4, 5.7, 10 and 24 GHz!). With the co-operation of Alan VK3XPD, Russell VK3ZQB, Trevor VK5NC and Colin VK5DK, an enjoyable two days was had by all with a total of four State records and one National record (5.7 GHz) broken in this period.*

"Equipment as follows: 3.4 GHz, 4 watts to 600 mm dish; 5.7 GHz, 8 watts to a 600 mm or 1200 mm dish; 10 GHz, 1 watt to a 600 mm dish; 24 GHz 40 mW to a 400 mm dish. All others contacted used similar power levels and dish sizes.

"Day one 6/11/96. After driving from Adelaide we lugged three dishes and three transit cases into position on Mt William for the first round of contacts with Alan VK3XPD portable at Mt Dandenong, 595 metres asl.

"Path distance = 259 km. Take-off to Mt Dandenong from Mt William is best described as ideal with a 900 metre drop a few hundred metres in front! Contact was established with VK3XPD/3 at 0640 on 3456.1 MHz with 5x4 SSB signals both ways. This was followed by a contact with VK3XPD/3 at 0716 on 5760.1 MHz with 5x3 SSB signals both ways. Both contacts established new VK3 State records, with the 5.7 GHz contact being a new National record.

"Having also lugged my 1.2 metre dish to the summit, a second contact was made at 0734 with the larger dish on 5760.1 MHz, signals 5x9 both ways. The contact was made even more interesting by the 25-35 knot winds that had sprung up! This made the standard tripod mount unusable, leaving VK5KK to hold the "baby" with a 1 degree beamwidth! Finally, at 0745, contact was made with VK3XPD/3 on 10368.1 MHz SSB with 5x1 signals. At this stage Mt William was submerged in a rain cloud, probably accounting for the lower comparative signal levels on 10 GHz. The wet conditions and temperature drop from 24 degrees to 5 degrees was a good test for the temperature stability of the microwave transverters!

"Contact was also made with Trevor VK5NC and Colin VK5DK on 144 MHz during the tests. After the successes with VK3XPD/3, Trevor VK5NC decided to go out portable to The Bluff, about 20 km west of Mt Gambier. The Bluff is about 280 metres asl, distance 198 km to Mt William. I decided to shift from the summit, down about 100

metres on the access road to gain some shelter. Weather conditions were wet at both ends. The first contact, with VK5NC/5, was established quickly, at 0910 on 3456.1 MHz with 5x6-7 signals on SSB both ways. This was followed by a contact with VK5NC/5 on 5760.1 MHz with 5x7-9 SSB signals both ways. The 1.2 m dish produced 5x9+ signals as expected! The contact on 5760 established a new VK5 State record. And at 0944, a contact with VK5NC on 10368.1 MHz produced 5x7-5x5 signals on SSB.

"On surveying the VK5NC/5 – VK5KK/3 path next day (I couldn't see 200 metres during the contacts) it was found to be anything but favourable with a series of ranges blocking the horizon in that direction at 5 and 15 km distance. The signals and lack of QSB on the VK5KK – VK5NC path was most notable. With calculated portable ERPs ranging between 1 kW (10 GHz) and up to 10 kW (5.7 GHz) being used by all three stations, it looks like weather conditions are optional on these paths.

"Day two 7/11/96. After finishing our round of contacts the night before, Alan VK3XPD and Aileen drove to Stawell for the next stage of our DXpedition ... 24 GHz. Equipment for 24 GHz consists of two identical 40 mW Gunn diode/mixers transceivers using wideband FM receivers and 400 mm dishes. The technology diverges somewhat from that of the lower bands, but you have to start somewhere!

"VK5KK went portable to Mt William again, this time with good weather and visibility for about 40 km. Our efforts concentrated on paths North East from Mt William, as it was decided that this was probably the best path and perhaps the driest. Water vapour absorption, at 24 GHz, can easily exceed 1 dB per km with medium to heavy humidity.

"VK3XPD/3 made first contact with VK5KK, on 24.150 GHz, from Stawell over 31 km, at 0030 with 5x9 signals. A series of contacts, between VK5KK/3 and VK3XPD/3 from various sites, pushed the distance out to 61 km with 5x8 signals from a hill near Landsborough at 0216. Atmospheric conditions precluded visibility over the path. A further attempt from Mt Bolangum, at 71 km, was not successful.

"A notable "ragchew" for the day was with Russell VK3ZQB/3 at Tower Hill near Pt Fairy, on 10368.1 MHz at 0440. Signals were 5x9++ over a distance of 116 km, the path being non line-of-site, takeoff from Mt William being blocked by the Grampian Ranges to the south. We both agreed we will shift off the Call Channel next time!

"Day three 8/11/96. Same as the day before, but conditions a bit drier with clear visibility to 60 km. Contacts were attempted on 24 GHz over the same path as the last two attempts on 7/11 (61 km and 71 km). Immediate contact was made over the Landsborough path at 2355. Progressing to Mt Bolangum, Alan VK3XPD/3 established contact with VK5KK/3 at 0025 with 5x8 signals over 71 km. This is a new VK3 State record. Further attempts over 75 km did not produce any contacts, due to both topography (less than ideal takeoff to Mt William) and water vapour absorption.

"We are all still learning about 24 GHz. Some interesting varying QSB effects (short term variations of >10 dB, a bit like mobile flutter sometimes) caused by wind effects along the path underline the effect of humidity. It has already been suggested that a hygrometer would be a useful addition to a portable 24 GHz station! It is estimated that the relative humidity was in the region of 50 – 60 %, over both days. Patches of moisture haze to above 1200 metres could be seen to rise from the large tracts of vegetation as the morning progressed. Further repeats of the exercise in summer should quantify the effect of this moisture.

"No doubt, this summer will see all of the above eclipsed ... more a tribute to the dedication and cooperation developing amongst a small group of active microwave experimenters in VK3 and VK5.

"A lot happened including a few ragchews with VK3ZQB and VK5DK, so we didn't become too lonely on Mt William."

As readers can note, microwave activity is on the increase in VK with amateurs in VK2, 3, 4, 5 and 6 making special efforts to extend the distances worked on those bands. I would like to hear what is currently taking place in VK2 and VK4 please.

Internet Six News

From the *On-line Six Meter Magazine* and Geoff GJ4ICD. 1/11/96: CT1WW now a Silent Key: **Geoff GJ4ICD** reports that: *"CT4KQ has reported the passing away of Tiago CT1WW. Tiago was an avid VHF DXer and many people worked him on 50 MHz and 144 MHz. I had personally built him equipment in the early eighties for VHF and knew him well. Tiago was also responsible for the 50 MHz beacon CT0WW. I am sure we will all miss him."*

3/11: TEP in JA: **JA1VOK** reports: *"Today I heard 45.24/45.25/45.26 ZL Ch.1 video at 0339-0600 for the first time this autumn. 45.25 was up to S9 around 0500, and ZL(?)KW (believed to be ZL1AKW) was heard on 50.110 CW in JA3 at 0455 in spite of Solar Flux of 69, A Index 2 and K Index 0 at 0300! JA3JTG (PM75) worked VK4TZL at 0509. VK4LE (QG45) was worked by JH1WHS (PM95) at 0506, JA1VOK (QM05) at 0513 and other JA1s until 0530 by Afternoon Type TEP for the fifth VK opening this autumn."*

5/11: Es in US up to 88 MHz: **Pat WA5IYX** and **Dave N5JHV** reported: *"Es to 88 MHz around 2300, with six metres double hop to east (EM90) around 0015, then switched south. Began hearing TI2NA/b about 0030, then worked TI5NE with very weak signals on 50.110. XE1KK/b still in at 0115."*

6/11: European new 50 MHz activity centre frequency. Changes to the Region 1 Bandplan now indicate the SSB centre of activity on 50 MHz has been moved to 50.150; hopefully this will improve the situation on the DX window of 50.110 MHz.

16/11: Es continues to be worked in Europe. GM7 to SP2, IK2 to IK0, G4 to SM3, GW0 to ES0 and ES6.

16/11: Widespread Es in US involving 1, 2, 3, 4, 5, 8, 9 and 0 districts. WA5UUD to VE3WHS. *[Rather late for this degree of Es ... VK5LP.]*

More News from VK

Adam VK3ALM reports:

"9/11: 0305 ZL TV all offsets (45.240 .250 .260) – weak. 10/11: 0203 VK4JSR 5x9. 12/11: 0350 VK4ABP/b Longreach beacon. 12/11: 0350 VK4WTN Hervey Bay. Es first noticed with central North QLD then moved South 300 km over two hours. 12/11: 2340 VK4ABP Longreach beacon QG26 539 1610 km; 2348 VK4ALM Rockhampton QG56 5x9 1700 km. 13/11: 0035 VK3SIX Wannon beacon QF12 519 on backscatter from VK4 bearing. 13/11: 0040 VK4AFL Brisbane QG62 5x9 1375 km;

0045 46.250 S9 Video VK2 translator? 0110 VK4RGG Gold Coast beacon QG62 599 1300 km; 0124 VK4GPS Mt Tamborine QG62 5x9 1300 km; 0129 VK4XJ Brisbane QG62 1350 km; 0130 VK5WI 10 m beacon PF95 559 – 6 m beacon not heard."

John VK4FNQ reports: *"11/11: 2340 weak TV signals on 46 MHz. 10/11/96 0000 VK4RGG/b 519; 0007 VK8RAS/b 319 in/out; 0130 weak 46 MHz TV Toowoomba; 0800 VK8RAS/b 599 very heavy QSB. 14/11: 2200 TV on 46 MHz. 13/11/96 2258 VK2BA worked VK4BRG 5x9+ also 57 MHz TV video; 2320 VK3SIX bcn 419 in/out; 0059 VK4AFL call CQ."*

Ron VK3AFW reports: *"Erected a 6 metre dipole on 16/11 for use with rig loaned to me by Andrew VK7XR. Worked Adrian VK2FZ/4 on 6 m Sunday am and had a good chat. Set up a MS sked for Monday am. Heard him in the first 15 seconds – six minutes in, his signal was so strong that I thought a local had broken in. The burn lasted for a minute.*

"Then at 1911:30 another big burn of 20 seconds. Two QSOs in 15 minutes on two meteor showers. We continued for the full hour and I heard several complete sets of

From left, Chip Angel N6CA, Roger Bowman VK5NY, Wally Green VK6WG and Walter Howse VK6KZ are all world record holders in the UHF and microwave bands. This photo was taken at the recent Microwave Update in Phoenix, Arizona. It's unusual to have so many world title holders together. Missing is Paul Lieb KH6HME, the Hawaiian end of so many records shared with N6CA. VK5NY and VK6WG had to travel half way around the world to meet for the first time. Photo from VK5NY.

callsigns but no burns greater than five seconds.

"16/11: 2155 144.200 VK2BIT 5x1 5x1 via aircraft enhancement; 2316 50.120 VK4ZTL 5x9 5x5 VK3AFW 3 W and dipole; 2355 50.120 VK4AR 5x9 5x6 VK3AFW 40 W and dipole*. 17/11: 0001 50.135 VK2YHN 5x6 5x6/7; 0034 50.059 VK4RGG/b 539; 0053 50.120 VK4KR 5x6/8 5x8/9; 0100 50.120 VK2FZ/4 5x5 5x8/9; 1906 144.200 VK2FZ/4 5x9 5x7/9 60 second m/s burn; 1911 144.200 VK2FZ/4 5x7 5x1 20 second burn; 2110 144.080 VK7XR 519 539 – not completed due to QSB (* wire dipole set at 45 degrees angle, centre 10 m above ground)."*

Ron added: ***"Adrian VK2FZ/4** on 14/11 worked ZL via tropo on 144 and 432 MHz. No one was available to attempt 1296 MHz.*

"Adrian recently worked K5GW via EME and hears a number of US and European stations on 144 and 432 MHz via the moon.

"Via aircraft enhancement, Adrian regularly works VK2DVZ, 550 km on 144, 432 and 1296 MHz, VK2ZAB, 780 km on 144 and 432, also 1296 until Gordon removed his antenna; VK2BE, 800 km on 1296 MHz. Adrian comments that there is little activity north of Brisbane except on FM, vertical polarisation and repeater operation."

John VK3ATQ reports that: *"The morning six metre net is now operating on 50.120 MHz. Norm VK3DUT is operating from his new QTH at Lakes Entrance and working ZLs with a three element beam. Brendon VK7JB has also joined the net, using a homebrew solid state 100 watt amplifier and a six element NBS design Yagi. He is received well in southern VK3 via normal tropo scatter."*

My long time friend **Clarry Castle VK5KL** says various beacons are indicating 50 MHz is often open despite the absence of other stations, and believes we could be headed for a good Es season. Heard so far: 14/11: 0245 VK7RAE/b 599. 15/11: 0100 VK7RAE/b 589, VK4RGG/b 579. 17/11: 0100 VK8RAS/b 589; 0430 VK6RPH/b 559; 0440 VK6RO in QSO with a VK5 3x3.

Microwaves in Europe

Sam Jewell G4DDK reports: *"The excellent lift on the evening of 22/10 produced some good QSOs on the higher bands. From the east coast the lift was towards the south, tending to favour the western side of France, with some tremendous signal levels here in Felixstowe. I worked three French stations on 2320 MHz; two down into IN97 and one in JN19.*

"On 10 GHz I had my annual contact with HB9AMH/p in JN37 at 684 km and 5x5 both ways. I also managed a contact with F6DKW in Paris on 10 GHz with 5x9 signal both ways. F5HFYs beacon from JN18 on 10368.044 was a consistent 5x9+ most of the evening. "Gotaway" of the evening was EA2LP in IN93 on 1296 MHz, who was heard replying to G3LQR, but who failed to complete the QSO. Now that would have been a nice QSO. There were plenty of 432 MHz QSOs into EA, but not too many on 1296."

Part Loss of 10 GHz in UK

A report from **Ian GM0ILB** notifies that The Radiocommunications Agency has announced that, as from 1 April 1997, UK amateurs will no longer have access to the band 10.150 to 10.300 GHz, as this will be required by Radio Fixed Access services. The present allocation is 10.000 to 10.500 GHz.

Europe

Ted Collins G4UPS said that the Namibia beacon V51VHF was heard over a wide area of the UK on 16/10 from 1530 to 1639. Around 1600 Brian G3HBR telephoned Ron 7Q7RM (Malawi) and Ron said the European TV had a rather strange aurora type sound. The 7Q7SIX beacon was operating but not heard in the UK. G3HBR and G4UPS did work 7Q7RM on 28.885 MHz but nothing heard on six metres. *[Appears to have been a mixture of aurora and TEP ... de VK5LP.]*

Closure

As I write these notes during the last week in November, the six metre Es on a large scale appears very elusive. I am hopeful that more can be reported next month.

When I began writing for *Amateur Radio* in 1969 these notes were prepared on an ordinary ribbon typewriter using carbon paper for copies. Then, in the 1970s, I advanced to an IBM electric typewriter using a carbon ribbon and a photocopier for copies.

About 1985 I invested in my first computer, an Osborne 1 CP/M machine using 360 k disks in A and B drives but no hard disk. The printer was a Brother daisy-wheel typewriter adapted for computer printout. In late 1989 a change was made to a new fangled XT computer with a 20 meg HDD and 5.25" floppy disk drive and a 24 pin dot matrix printer.

This was later followed by a Ritron 486DX33-LB with 212 meg HDD and both 5.25" and 3.5" floppy drives, with the later addition of an ink-jet printer and a scanner; so, for the past three or four years, my notes have been submitted on a 3.5" disk. This computer is now facing possible (or probable) replacement.

This month I start a new era in that my notes will be forwarded via e-mail. A test-run with Bill Roper indicates that such a method is quite successful – so much for modern technology.

Incidentally, I am very pleased to note that Bill Roper will continue to produce *Amateur Radio* for the next two years, having been awarded the contract by the WIA. Best wishes Bill and, thanks for a job well done.

Closing with two thoughts for the month:

1. No one has yet programmed a computer to be of two minds about a hard problem or to burst out laughing; and

2. Manufacturers may be able to make the car safer in collisions, but there seems to be no way to redesign pedestrians.

73 from The Voice by the Lake.

*PO Box 169, Meningie SA 5264
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC
E-mail: vk5lp@ozemail.com.au*

ar

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:

J N (John)	Segelov	VK2YKK
B J (Ben)	Weideman	VK3AUW
H J K	Heitsch	VK4HK
A C (Al)	Rechner	VK5EK
H G	Burniston	VK5NJG
R W (Elliott)	Peterson	VK6PW

Al Rechner VK5EK

Al VK5EK sadly passed away on 14 November following several years of serious illness.

His job as a bank officer and later as a bank manager required him to work in various parts of the state, ranging from Crystal Brook to Mt Gambier, where he made many friends, frequently resulting in the promotion of amateur radio.

Al's enthusiastic approach to his hobby coupled with his unique personality, and renowned ability to manufacture home brew antennas and other equipment, became legendary.

In retirement his specially selected QTH at Old Noarlunga gave him substantial advantage in the pursuit of amateur radio as his main interest.

As a licensed amateur pilot Al also enjoyed flying, having owned his own aircraft at one stage. Astronomy and photography were among other interests at which he excelled.

During his retirement Al gave much of his time voluntarily to the Investigator Science and Technology Centre, where he regularly lectured and demonstrated equipment to groups of school children and others in relation to various scientific subjects.

Al was an active amateur to within days of his death, and I join with the following who were in regular contact with him, in expressing sincere condolences to his family: Peter VK5ZPS, Udo VK5KAZ, Graham VK5JD, Col VK5RO, and Dean VK5BDS.

Barry Cleworth VK5BQ

Elliott Sydney Trigwell

Many of the VK6 fraternity mourn the passing of Elliott Sydney Trigwell (affectionately known as Trig).

Trig was born on 17 April 1918 in Bunbury, WA and was educated in Donnybrook WA, completing his education at Bunbury High School.

Leaving school at the age of fifteen, he started a long and successful career with the then Postmaster General in Telecommunications. Trig had always been interested in the technical side of radio so he considered himself lucky to have a career that was also a great hobby.

Trig served his country in the Royal Australian Air Force during the war and was posted overseas to New Guinea. He resumed his career with the PMG's Department after the war and, in the Geophysical Year of 1957, was lucky to be chosen to work and study at the Davis Radio Base in Antarctica with four others. He became the official photographer and Officer-in-Charge and even had an island named after him, Trigwell Island.

The highlight of this expedition was the honour bestowed on him by Her Majesty, Queen Elizabeth in 1961, the Polar Medal for Good Service, which was presented by her Majesty on her visit to Perth.

Trig became the Superintendent of the Radio Branch in WA and is fondly remembered by many WA hams for his helpful advice and consideration in his dealings with the amateur fraternity.

Trig was well qualified and eligible to take out an amateur licence, and held the call sign VK0AT during the time he spent in Antarctica.

After his retirement he maintained his close association by regular attendance at the Old Timers' functions.

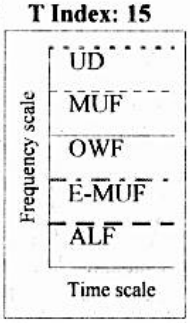
Vale Trig.

Clem Patchett VK6CW

ar

HF Predictions

Evan Jarman VK3ANI



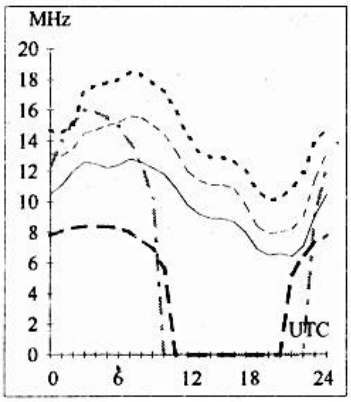
These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. They also indicate a possibility of communication (percentage).

The frequencies identified in the legend are:-

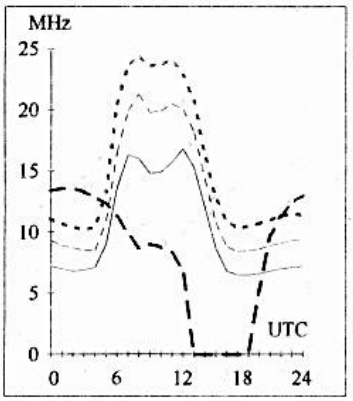
Upper Decile (10%)
Maximum Useable Frequency (50%)
E layer MUF
Optimum Working Frequency (90%)
Absorption Limiting Frequency

The predictions were made by one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The Australian terminal azimuth (degrees), path length (kilometres) and propagation modes are also given for each circuit. **ar**

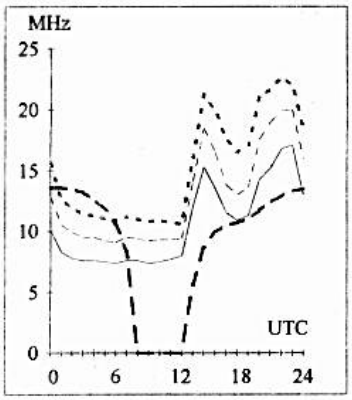
Adelaide-Jakarta 307
Second 3F14-22 3E3 Short 4566 km



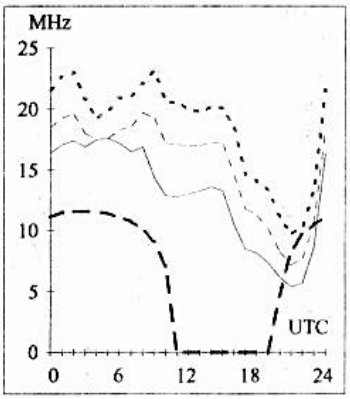
Brisbane-Amsterdam 325
First F 0-5 Short 16192 km



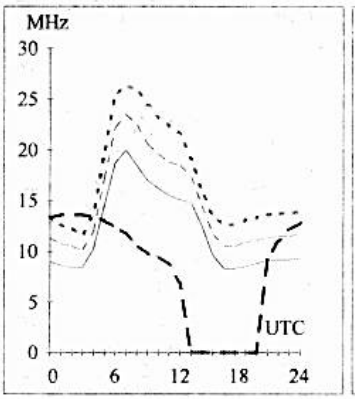
Adelaide-Montreal 57
First F 0-5 Short 17062 km



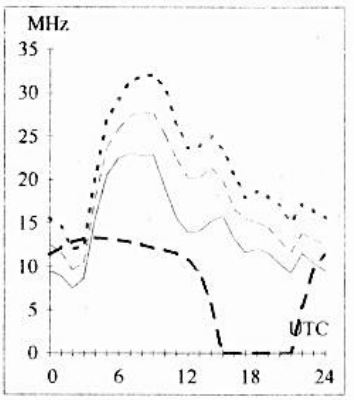
Brisbane-Bangkok 302
First F 0-5 Short 7281 km



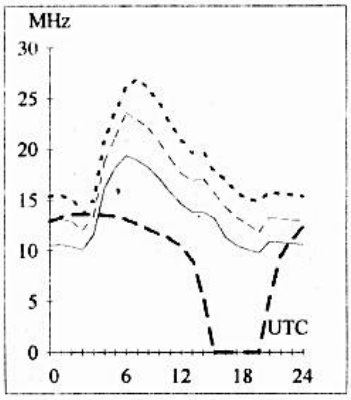
Canberra-Berlin 313
First F 0-5 Short 16064 km



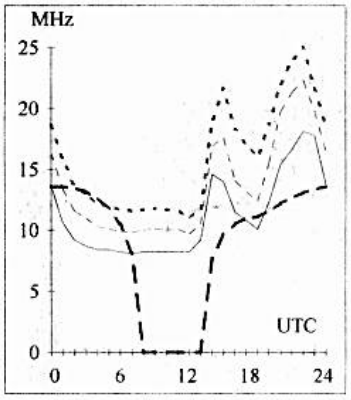
Darwin-Cairo 298
Second 4F2-6 4E0 Short 11609 km



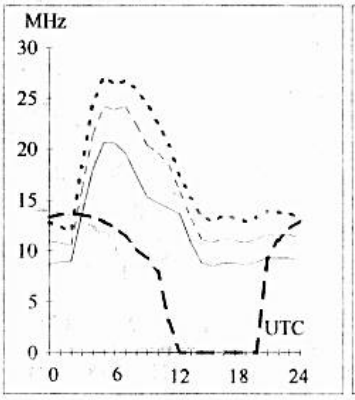
Adelaide-Oslo 294
First F 0-5 Short 15632 km



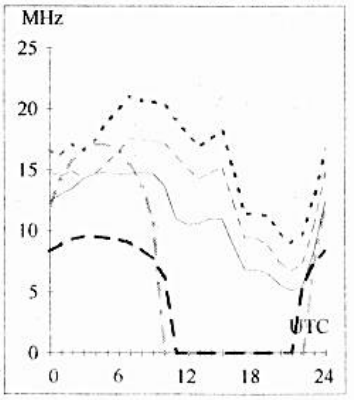
Brisbane-Boston 56
First F 0-5 Short 15722 km



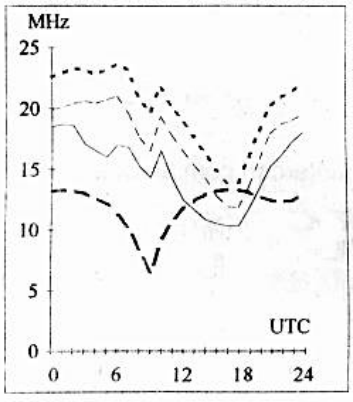
Canberra-Moscow 317
First F 0-5 Short 14481 km



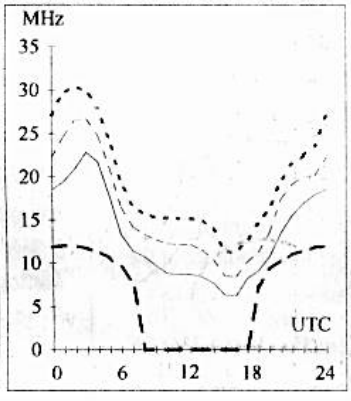
Darwin-Kuala Lumpur 296
Second 2F10-21 2E1 Short 3656 km



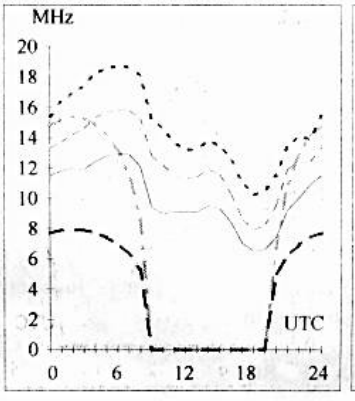
Adelaide-Santiago 155
Second 4F3-6 4E0 Short 11818 km



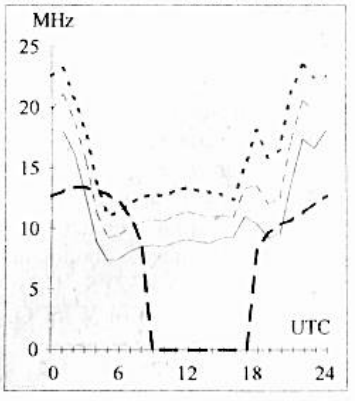
Brisbane-Honolulu 49
Second 3F5-10 3E0 Short 7568 km



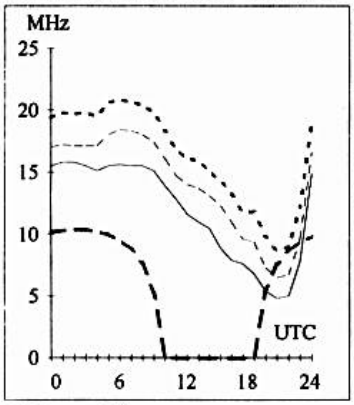
Canberra-PortMoresby 355
Second 2F15-23 2E4 Short 2870 km



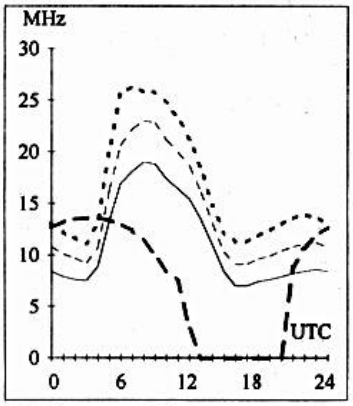
Darwin-Seattle 44
First F 0-5 Short 12283 km



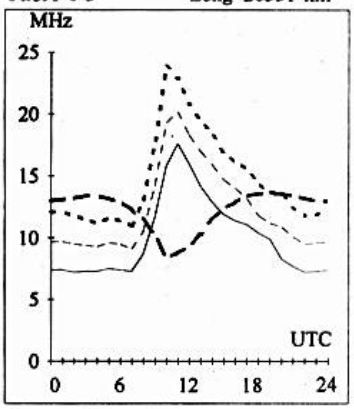
Hobart-Hanoi 320
Second 4F8-15 4E0 Short 8277 km



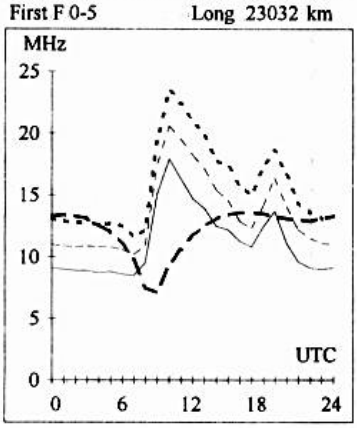
Melbourne-Helsinki 321
First F 0-5 Short 15205 km



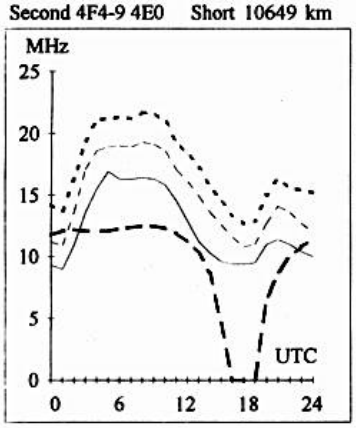
Perth-Copenhagen 139
First F 0-5 Long 26331 km



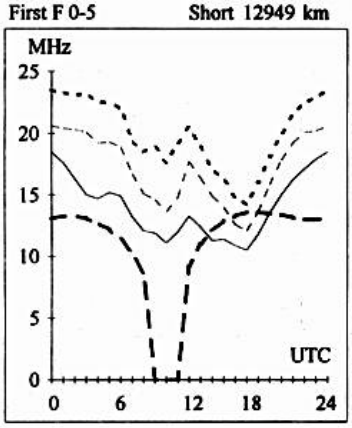
Sydney-London 139
First F 0-5 Long 23032 km



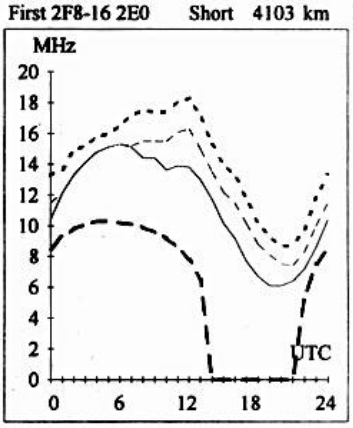
Hobart-Harare 239
Second 4F4-9 4E0 Short 10649 km



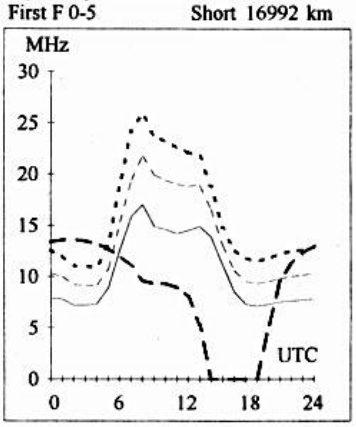
Melbourne-Lima 133
First F 0-5 Short 12949 km



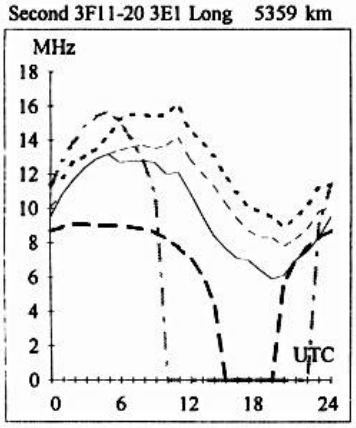
Perth-Heard Is. 222-72
First 2F8-16 2E0 Short 4103 km



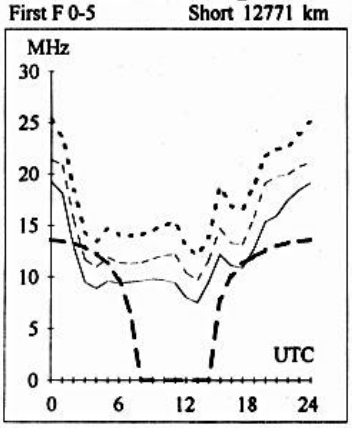
Sydney-London 319
First F 0-5 Short 16992 km



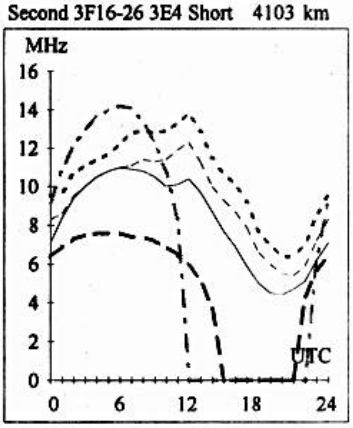
Hobart-Heard Is. 231-109
Second 3F11-20 3E1 Long 5359 km



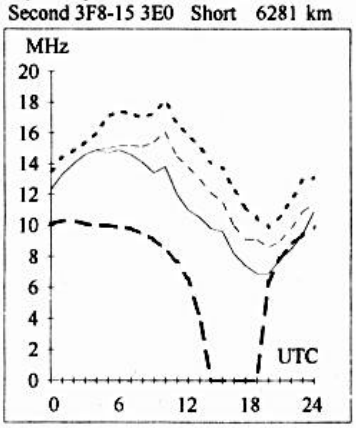
Melbourne-Los Angeles 65
First F 0-5 Short 12771 km



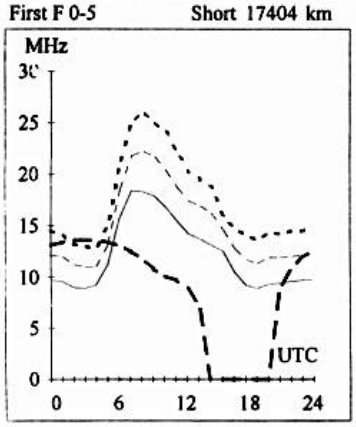
Perth-Heard Is. 222-72
Second 3F16-26 3E4 Short 4103 km



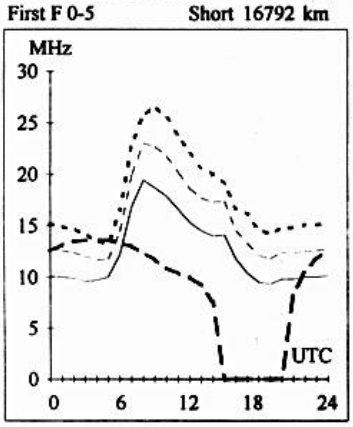
Sydney-Heard Is. 225-103
Second 3F8-15 3E0 Short 6281 km



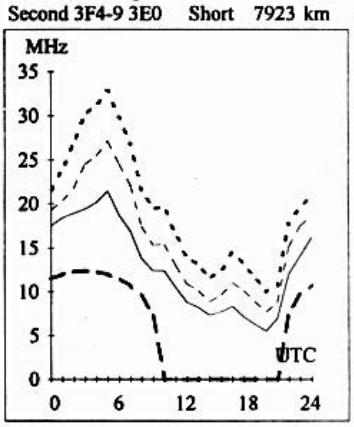
Hobart-London 303
First F 0-5 Short 17404 km



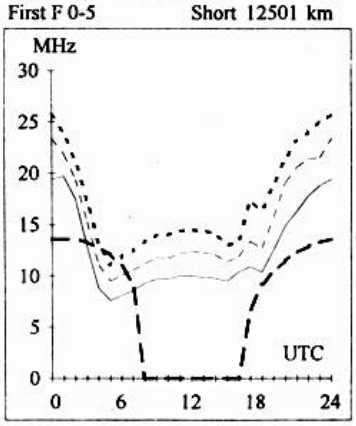
Melbourne-Paris 305
First F 0-5 Short 16792 km



Perth-Tokyo 20
Second 3F4-9 3E0 Short 7923 km



Sydney-Vancouver 45
First F 0-5 Short 12501 km



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX programs** for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** – Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special 5 hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069.

Internet address rhg@ozemail.com.au.

FOR SALE ACT

Hewlett Packard sig gen, 612A 450-1230 MHz, 618C 3.8-7.6 GHz, 606A 50 kHz- 65 MHz. **RF millivoltmeter** 411A, 3406A, 410C. **Digital Multimeter** 3476B. Avo- 8, Avo-73. **Klystron power supply** 715A. **RF Bridge** GR-1606A. **Mod meter** TF- 2300B. Peter VK1CPK, 30 Chirnside Circuit, Kambah ACT 2902 (06) 231 1790.

FOR SALE NSW

Yaesu FT-901D tcvr, **FV-901DM** scanning VFO 40 memory, **YO-901** multi-scope, **YM-34** desk mic, $900 ono. **Yaesu FT-209RH** 2 m handheld, never used, **PA-3** car adapter/charger, **MH-12** speaker mic, $450. **Yaesu MD-1B8** desk mic, unused, $100. **Hi-Mound MK-701** telegraph key, unused, $100. **Palomar TX-200** HF 80-10 m linear amp, $250 ono. **Tokyo Hy-Power HC-2500** heavy duty ATU; $500 ono. Home-made ATU, $150. All items good condition. Peter VK2DBI QTHR (063) 675 095.

Deceased Estate. **Yaesu FT-757GX,** sn 4G 092522, hand and desk mic. IC-22S, sn 11064. **WELZ SP250** SWR/Pwr meter, sn 251016. Home brew PSU. Kenwood dummy load. **18AVT** vert antenna. $1000 the lot. LAO. Jim VK2DPU QTHR (02) 9629 1429.

TS-711B, 70 cm all mode, as new condn, $1100. **TS-700SP**, digital readout, all mode 2 m, $650. **Uniden 2510**, all mode, 10 m, $400. **Kantronics KPC-3**, 32 k version, latest, new, not going into packet. All items are in as-new or top condn. All items include h/books, circuits, boxes. Prices or near offer. A Walsh VK2TBW (048) 61 2092 fax (048) 61 1536.

6 position **co-ax switch,** $10. 50 ohm 500 watt **dummy load**, 1.5 kg, $5. 6 silver plated **N in-line sockets,** new, $5 each. **Kenwood DM81** dip meter, 0.7-250 MHz, inductive and capacitive coupling, solid state, for indoor/outdoor measurements, $75. Advance **signal generator** type B4B7, continuous coverage 1 kHz to 30 MHz, with leads, $150. 2 of 350 µµF, HV, ceramic insulated, **tuning cap**, $10 each. 2 gang 15 µµF, wide spaced **tuning cap**, vernier tuned, $5. Large, wide spaced, silver plated, **roller inductor,** $40. Medium sized **roller inductor**, ceramic, $30. 2 gang 5 µµF **tuning cap,** $10. Single 15 µµF wide spaced **tuning cap**. $5. 2 of 50 mm 9:1 **vernier dial**, $10 each. Adjustable **Variac xformer**, 10-300 V 2 amp, $50. 240/110 V 200 VA **xformer**, $40. **Homebrew ATU**, $15. Jack VK2AZP QTHR (02) 9476 4013.

FOR SALE VIC

Kenwood TL-922 1.2 kW PEP all band linear with set of new 3/500Z tubes and handbook, EC, $2500 ono. **Icom IC-7000** all mode receiver covering 25 to 1300 MHz, handbook, EC, $1200 ono. **Star LC24-15** wide carriage 24 pin dot matrix printer with tractor feed, never used and in pristine condn, with manual and cables, $200 ono. Harold VK3AFQ (03) 9596 2414.

Kenwood TS-930S HF txcvr, professionally modified to include switchable narrow SSB filtering, complete with mic, handbook and workshop manual, unmarked as new condition, $1495. VK3BR QTHR (03) 9584 9512

Hy-Gain 204BA beam antenna, complete with all hardware, balun and instruction manual, as new condn, $300. Reg VK3LS QTHR (03) 9379 3619.

Yaesu FT-470 dual band handheld, in vg condn with service h/book, spare battery, charger and carry case, covers 140-174 MHz and 430-500 MHz, $500. Phone (03) 5152 4027 and ask for Ian. Rob VK3DEM.

Radio transmitter, pre-1980, in steel cabinet 635W x 340D x 1900H, 2 doors, 6 shelves, ex VK3KC, $330. Beverley Williams (03) 9376 5573

FOR SALE QLD

Yaesu FL-2100 linear amp, manual, little used, good condn, $650. VK4EB (07) 5546 6164.

TET 443DX 40/20/15/10 4-el Yagi, boxed ready to ship, incl balun, $350. Or swap for 20 m monoband Yagi or log periodic. VK4EET QTHR (07) 3801 3200.

Radiotron Designer's Handbook, 4th edition 1955, $50. **Drake's Cyclopedia of Electronics** 1933, $35. **Leader LDM815** GDO, $80. 3000 miniature, octal, metal receiving valves, $700. Peter Hadgraft VK4APD, 17 Paxton St, Holland Park, Qld 4121 (07) 3397 3751 AH.

FOR SALE SA

GME Electrophone 11 amp regulated power supply, sn 5129340, as new, $125. Hank VK5NCA (08) 8272 7435.

FOR SALE TAS

Yaesu FT-747GX, Rx 500 kHz to 30 MHz, Tx 160 – 10 m, built-in CW, SSB, and AM filters, as new condn, boxes, manuals, etc. Allen VK7AN (03) 6327 1171 Mobile 018 134837.

WANTED NSW

Manual and circuit for Kenwood TS-900, all photocopy and postage expenses paid. Also looking for Icom IC-735 or similar solid state rig, must be unmodified and in original condn. Stan VK2BRZ QTHR (044) 417 061

McDonald Pendograph and Automorse keys. Also any books or manuals on the above keys, photocopies OK. Pay top dollar for good condn keys. Steve VK2SPS (02) 9999 2933 after 6.00 pm.

Philips sweep and marker generator type **GM28775 instruction manual**, or any operation information, all expenses paid, etc. Maurie VK2OW QTHR (02) 9838 1834.

WANTED VIC

Owners manual/circuit diagram for **KUWANO** electronic voltmeter, model VP- 109, all costs met plus $5.00 bonus. Reg VK3CCE QTHR.

FM747 UHF and Weston VHF **FM661**, in working order or not, also any information sheets. Stan VK3SE QTHR (03) 5332 2340 evenings.

DM5 desk mic or similar with pre-amp to suit much loved and faithful Icom 720A. Arthritis in fingers making handheld mic use difficult. Ron VK3LPM (03) 5368 9477.

WANTED QLD

4 or more el **20 m Yagi** or **8 el log periodic antenna,** in good condn, cash or swap TET 443DX 4 el 40/20/15/10 m Yagi. Eddie VK4EET QTHR (07) 3801 3200.

Bird Thruline RF directional wattmeter model 4311, 4314 or similar, amp not necessary, plug in modules optional. Graham VK4FGB QTHR (070) 541 448.

WANTED WA

Power transformer for Yaesu YO-901 multiscope, must have primary windings for 234 volts. Bob VK6ABS QTHR (090) 754 136.

MISCELLANEOUS

• THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX pictorial cards special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

ar

WIA News

A Role for Ham Radio on the Space Station

During November, amateur radio delegates from eight countries met at the NASA Johnson Space Centre in Houston, Texas, to lay the groundwork for plans to include a permanent amateur radio station aboard the International Space Station and to be operated by crew members, according to The ARRL Letter of 29 November 1996.

Delegates to this meeting came from Canada, France, Germany, Great Britain, Italy, Japan, Russia and the United States. The delegates jointly developed a draft memorandum of understanding to promote the development of amateur radio on the International Space Station, to be known as ARISS.

An ARISS group will provide for the planning, coordination and performance of amateur radio projects on the space station, similarly to the way the SAREX Working Group currently coordinates amateur radio activities on many space shuttle missions. Amateur Satellite Corporation (AMSAT) and International Amateur Radio Union (IARU) organisations in each of the eight countries are to review and consider approving the memorandum of understanding.

When you buy something from one of our advertisers, tell them you read about it in the WIA *Amateur Radio* magazine

Hamads

Please use a separate form for **For Sale** and **Wanted** items, and be sure to include your name, address and telephone number (including STD code).

- Eight lines per issue free to all WIA members, ninth line for name and address. Commercial rates apply for non-members.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment offered for sale should be included in the Hamad.
- QTHR means the address is correct in the current WIA Call Book.

State .....

- Ordinary Hamads from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines, plus $2.25 per line (or part thereof), with a minimum charge of $25.00.
- Copy typed or in block letters, by the deadlines shown on page 1 of each issue of *Amateur Radio*, to:

Postal: 3 Tamar Court, Mentone VIC 3194
Fax: (03) 9584 8928
E-mail: vk3br@c031.aone.net.au

Please check one box: ❑ For Sale ❑ Wanted ❑ Miscellaneous

Not for publication:

Name: Call Sign: Address:

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

	Division Address	Officers			Weekly News Broadcasts		1997 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Kobier	VK1PJ VK1ZAO VK1KIP	3.570 MHz LSB, 146.950 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 9689 2417 Freecall 1800 817 644 Fax (02) 9633 1525	President Secretary Treasurer (Office hours Web:http://marconi.mpce.mq.edu.au/wia e-mail address: wiansw@sydney.dialix.oz.au Packet BBS: VK2WI on 144.850 MHz	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Fri 11.00-14.00 Sat 1000-1300 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours Tue & Thur 0830-1530)	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$75.00 $61.00 $47.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer e-mail address: wiaq@tmxbris.mhs.oz.au	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$TBA $TBA $TBA
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 8352 3428 Fax (08) 8264 0463	President Secretary Treasurer Web: http://www.vk5wia.ampr.org/	Peter Watts Maurie Hooper Charles McEachern	VK5ZFW VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. 3.585 MHz and 146.675 MHZ FM Adelaide, 1930 hrs Monday.	(F) (G) (S) (X)	$75.00 $61.00 $47.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Christine Bastin Bruce Hedland-Thomas	VK6LZ VK6ZLZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$66.75 $48.60 $32.75
VK7	Tasmanian Division 5 Helen Street Newstead TAS 7250 Phone (03) 634 42324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$74.00 $60.00 $46.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times

ADVERTISERS' INDEX

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore, advertisers and advertising agents will appreciate the absolute need for themselves to ensure that the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

Tough, Compact, Economical

Yaesu FT-50R
2m/70cm Handheld

For the foremost in top performing, durable, and economical dualband handhelds, there's now only one choice, Yaesu's amazing new FT-50R!

Manufactured to rigid commercial grade standards, the FT-50R provides 2m and 70cm band transceive coverage plus an amazingly wide receiver range (76-200, 300-540, 590-999MHz*), all in a compact package with water resistant construction that's tough enough to meet the USA MIL-STD-810 rating for shock and vibration resistance, yet is easy to hold and use.

Measuring just 57 x 99 x 30mm (WHD) with the supplied FNB-40 650mA/H Nicad pack, the FT-50R provides 2.0w RF output on the 2m and 70cm bands as standard, and can provide up to 5.0w output when operated from a 12v source (optional Nicad battery or vehicle lead). It also provides 112 memory channels including two Home memories, an Alphanumeric display for channel naming (ie. repeater locations or callsigns) with Omni-glow backlighting, and CTCSS encode for accessing repeaters that require a tone input. Selectable AM/FM receive modes allow for greater flexibility during extended receive operation.

For ease of use, the FT-50R provides super loud speaker output, an Auto Range Transpond System to determine if you are in range of another ARTS equipped transceiver, a Dual-watch system for monitoring sub-band activity, and four Battery saver systems for longer operating times. A selectable LCD voltmeter also allows you to monitor battery performance under load so you can estimate remaining battery life. You can also use the FT-50R with the optional ADMS-1C Windows based PC software/interface to quickly program features or clone programming to other compatible Yaesu radios.

The FT-50R is tough, easy to use, and one of the most economical dualband handhelds you can buy. There's now only one choice, the FT-50R from Yaesu.

(* Cellular blocked)

D-3655

YAESU

$599

2 year warranty

DICK SMITH ELECTRONICS

B 2659

OUR WIDE BAND RECEIVER RANGE IS NOW EVEN WIDER.

Our wide band receivers give you the world. Starting with our new IC-R10, an exciting upgrade of the popular IC-R1 which led the way in handheld receivers. The IC-R10 has a wide frequency coverage of 0.5 MHz to 1300 MHz and is an all mode (FM, WFM, SSB, CW, AM) unit. Features such as a real-time bandscope function, making it easy to find busy frequencies, are firsts for handheld receivers.

IC-R9000

Our top of the range IC-R9000 covers 100 kHz-1999.8 MHz in all modes and features Icom's unique CRT display, intelligent scan functions and an amazing 1000 memory channels, in a unit that delivers superb high frequency stability, even in the GHz range.

IC-R8500

The IC-R8500 is another exciting newcomer with a frequency range of 0.1 to 2000 MHz, excellent frequency stability, and outstanding high receive sensitivity characteristics. With an RS-232C interface allowing direct connection to a PC, the new IC-R8500 is truly a state-of-the-art communications receiver.

IC-R100

Our mobile IC-R100 is packed with features and covers the 100kHz-1800 MHz range in AM, FM, and WFM modes with multi-function scanning and 100 memories with 20 scan edge channels. With the expanded Icom range of communications receivers... the world's radio signals have never sounded so good. Talk to your Icom dealer Atoday for the full technical story.

CALL FREE: 1800 338 915
290 -294 Albert St Brunswick Victoria 3056
Ph: (03) 9387 0666 **Fax:** (03) 9387 0022

ICOM
Clearly Ahead